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Original Communications.

THE RELIEF OF PAIN IN THE EYES.

By Edward Jackson, A.M., M.D.*

GENTLEMEN:—As pain is the symptom the patient most readily accepts as evidence of disease, its permanent and full relief will be most promptly recognized as evidence of therapeutic skill. And, in view of the overshadowing importance that pain is liable to assume in the minds of the patient and his friends, it is worth while to devote a lecture to considering somewhat systematically the means available for its relief, when it arises in connection with diseases of the eye. The variety and specialization of these means that we have at our command is some index of the stage of advancement of ocular therapeutics in general.

In any case the first thing to be done is to get as clear an idea as possible of the character of the pain, and so be enabled to connect it with the underlying morbid condition. For instance, a patient suffering from conjunctivitis might experience the smarting, burning to be spoken of as conjunctival pain, or he might be suffering the deeper aching pain of deep inflammation; or perhaps he experiences the intense neuralgia which attends serious

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lesions of the ophthalmic branch of the fifth nerve; either to be relieved only by special measures that would exert no good influence whatever on the other kinds of pain. The necessity for distinguishing between these different sorts of pain is obvious.

What we may term *conjunctival pain* is generally spoken of as smarting, burning, the feeling of a foreign body under the lid. It arises from disturbance of the endings of the nerve-fibrils attending disturbance of the epithelial and subepithelial layers of the membrane. It may be aggravated by any stimulant or irritant; use of the eyes or exposure to light may aggravate it. But, on the other hand, there is a very important factor in determining its intensity in the irritability of the nerve-endings concerned, and undue protection of the eyes from use or stimulation is very likely to so increase this irritability as to add to the aggregate amount of suffering. We frequently see cases, particularly in children with phlyctenular ophthalmia, which greatly increase their suffering by their efforts to protect their eyes from irritation and stimulus. One of the first things to be done, then, for this kind of pain is to discontinue the use of any bandage; to see that the hand or handkerchief is not kept pressed against the eyes most of the time. In much the same direction is the action of silver nitrate solutions applied to the inflamed palpebral conjunctiva. Although the first effect is to cause an increase of the smarting, the ultimate influence may be that of the most reliable of anodynes. This is true in a large class of cases of chronic catarrhal inflammation of the conjunctiva, attended with such aggravated and persistent smarting and burning as even to prevent the opening and use of the eyes. In such cases pain becomes the special indication for the use of this or some similar drug.

Also calculated to reduce the irritability of the parts are such measures as dashing cold water in the face or plunging the head into it, the bathing of the closed lids with very hot water for a brief period, or, as Dr. Lippincott, of Pittsburg, has recently suggested, the dropping of very hot water directly into the eye. Pain of this kind is very promptly relieved by the application of cocaine to the affected surface. But the influence of cocaine in this direction is so evanescent, and the return of the pain is so prompt that there is always a very strong temptation to repeat the instillation of the drug at very short intervals, and to do this is extremely dangerous to the cornea. Cocaine used for this purpose should be guarded by especial care to make the intervals between the instillations not less than six hours. In addition to this precaution, it is best for this use to combine with the cocaine either eserine or atropine. The cocaine frequently repeated has a strong tendency to aggravate the conditions causing this sort of pain, and in this way to produce more pain and cause unnecessary injury to the eye. Atropine and eserine, however, though in some ways direct antagonists, the one to the other, seem to possess in common the power of preventing the bad effects of cocaine on the conjunctiva and cornea, and possess considerable power of relieving the pain of corneal disease.

The *pain of corneal disease* grades from a severe smarting, such as has been designated conjunctival pain, into intense tenderness and soreness resembling that which attends acute inflammation, with swelling in other parts of the body, or severe aching. For such pain one may order,—

℞ Atropine sulphate, gr. i;
Cocaine hydrochlorate, gr. i;
Distilled water, ʒii. M.
One or two drops to be instilled every four or six hours.

Or,

℞ Eserine sulphate, gr. ⅛;
Cocaine hydrochlorate, gr. ii;
Distilled water, ʒiv. M.
One drop to be instilled every four or six hours.

The atropine formula is better suited for cases of recent injury of the cornea, as abrasion from the finger-nail, often a very painful injury, and in those cases in which there is reason to suspect iritis. The eserine is particularly applicable to corneal ulcers, especially to an extremely chronic form of ulcer that is apt to occur in aged and poorly-nourished persons, and which is attended with very great pain. Generally, however, I prefer, instead of giving one of the above solutions to the patient, to instil the cocaine myself, perhaps repeating it once or twice, and simply to give the solution of the atropine or the eserine alone, to be regularly used at stated intervals by the patient. And really for lasting relief in these conditions, the cocaine is often an unimportant factor in the treatment, and the eserine or atropine the essential medicament.

The application of heat over the closed lids finds in the relief of the pain from corneal ulcers and interstitial keratitis one of its most valuable applications. The heat is to be ap-

plied either as dry heat by means of hot cloths, hot bran, hot iron wrapped in cloth, or the Japanese hot box recently suggested by Dr. Chisholm,—a light metal box in which the heat is kept up by slow combustion ; or as moist heat by the application of cloths wrung out of very hot water, or the bathing of the closed lids with water as hot as it can possibly be born, the temperature being sustained by adding boiling water from time to time. Where the dry sources of heat are employed, the application may be made more or less continuously. But the bathing with hot water is best to be brief, not lasting over three or five minutes, because if prolonged it begins to play more or less the *rôle* of a poultice, and is likely to aggravate the conditions which produce the pain. In some cases of corneal disease its whole character as regards pain may be changed by application of the actual cautery.

For the aching *pain that accompanies inflammatory hyperæmia*, we have in the local abstraction of blood a most valuable resource. The beneficent influence of leeching, either with the natural or the artificial leech, is perhaps best illustrated in cases of iritis or irido-cyclitis, attended with a high grade of hyperæmia and severe pain. But in other inflammatory troubles, especially general inflammation of the globe after traumatism, violent keratitis, or conjunctivitis, with great swelling of the lids, the abstraction of one or two ounces of blood from the temple gives a respite from pain that cannot be as safely obtained in any other way. In such cases it is well, as a rule, to have the leech applied late in the afternoon or in the evening. And I have repeatedly seen the refreshing sleep that followed such relief change the whole character and progress of a case of irido-cyclitis. It should have been remarked in passing, that for chronic conjunctival smarting, in cases in which the injection of the conjunctival vessels is the leading characteristic, rather than the thickening and other alterations of the epithelial layer of that membrane, the direct abstraction of blood, by scarification of the conjunctival surface of the lid, is often highly appreciated by the patient, and, in conjunction with other treatment, may promote the cure of the condition. Free scarification of the lids is also likely to give marked relief in acute inflammation of the parts, attended with great swelling.

In young and vigorous patients with sound nutrition, as in young men who are suffering from traumatism of the eyeball or from gonorrhœal ophthalmia, we may resort to the continuous application of cold to the closed lids. But to effectively relieve or prevent pain, the application must be continuous. Commonly this is effected by placing a block of ice near the patient's head, and laying on it small pads of gauze or lint, which, when cold, are placed immediately on the closed lids, the presence of an attendant being constantly required to change the pads from the eye to the ice, and *vice versa*, every two or three minutes. Care must be taken in using this remedy not to depress the local processes of nutrition to such an extent as to hinder the repair or lead to the breaking down of the cornea. And the necessity for the avoidance of intermissions is absolute, since, if such intermissions occur, the reaction arising therefrom will nullify any benefit that might otherwise have been expected from the treatment.

Aching and *neuralgic pain*, in and around the eyes, may be of the same nature as aching or neuralgia elsewhere, as in the case of the pain that comes on when you eat an ice too rapidly, —an instance of reflex pain ; or the pain that often attends ophthalmic zoster, the pain of serious disease of the trunk or nucleus of a sensory nerve, and as such it is to be met by the application of general principles. But in a large majority of cases such aching is an indication of eye-strain, and is to be met by the removal of the cause. This subject of eye-strain, and the subjects of ametropia and heterophoria, that are closely connected but by no means identical with it, cannot be entered upon at the present time. But you will please bear in mind that there are few more striking instances of our power to relieve pain than that of the influence of a mydriatic on an inflamed, strained, ametropic eye. To exert this influence in the most striking manner, however, the mydriatic must be efficiently applied. For instance, homatropine should be used in a solution of at least the strength of two per cent., which should be instilled a drop every ten minutes for an hour. And with the stronger mydriatics, like atropine, care must be taken that the solution does get well into the eye, for, applied by the patient, or some member of his family unskilled in such manipulations, so small a part of it may reach its destination as to fail to subdue the pain, or even it may aggravate it.

Probably the most intense aching pain that is felt in the eye is that of severe glaucoma. No other pain is capable of breaking down more completely the endurance and general

health of the sufferer. Like other severe pain starting in the eye, it soon comes to be referred as well to neighboring parts,—the brow, the cheek, the whole side of the head. I trust that in any case of severe pain of this region that no one of you will fail to think of glaucoma. For such pain, the treatment is emphatically the treatment of the glaucoma. Eserine may in some cases temporarily give relief, but iridectomy is the remedy to be resorted to at the earliest possible moment in all suitable cases. The bathing with hot water, or the local abstraction of blood, may prove useful palliatives or adjuvants.

Doubtless you have already noticed that thus far those drugs that would usually be placed at the head of a list of general analgesics have not been mentioned. This neglect has been intentional, for, in any given case, such drugs should be resorted to only when required to supplement the measures we have already considered, and it is to be feared that far too often the practitioner thinks of them first. If pain in or about the eye is not pretty well relieved by the judicious application of the measures already referred to, it is not likely to yield entirely to anything less than excessive doses of these drugs,—doses that in the end will so influence the nutrition of the parts as to leave the patient the worse for their use. In giving opium, or its derivatives, antipyrin, acetanilide, or their congeners, to relieve ocular pain, exhibit them in small doses, say ⅛ grain or less of morphine, and, as far as possible, keep down the aggregate amount of the drug administered. Give these drugs with the idea of making the pain bearable, not with the thought of temporarily suspending it altogether, and you will not be disappointed, neither will you hinder the ultimate relief and cure. Rather than give them to the point of narcotism, as would be needful to abolish or nearly abolish the pain of severe glaucoma or iritis, you had better withhold them altogether.

When, in spite of all our methods of relief, an eye remains persistently painful, and has lost all sight, and such painful eyes are almost invariably sightless, we can resort to the operation of severing the nerves that supply the eyeball, or to its complete enucleation. Of these operations, let me only say here that the latter is by far the easier, and should be within the abilities of every surgeon.

Briefly to recapitulate some of the important points with reference to the relief of pain in the eyes:

Your efforts in this direction should all be based on an exact recognition of the kind of pain to be dealt with, and of its cause.

For conjunctival pain, endeavor to reduce the irritability of the parts, by exposure to the air, by heat, cold, astringent applications, with perhaps the use of cocaine with great caution for temporary effects.

For corneal pain, the use of eserine or atropine, with heat, even to the actual cautery, will give relief.

Aching and intense soreness, attending inflammation, may yield to heat or cold, or the local abstraction of blood.

Aching, without inflammatory disease, is mostly due to eye-strain, and must be treated accordingly.

Glaucoma pain demands the specific recognition and effective treatment of the glaucoma.

The general analgesics are to be used cautiously and as adjuvants to other treatment.

When all other means have failed, we can resort to enucleation of the globe.

SALOL IN DIARRHŒA.

By M. H. Fussell, M.D.*

A RECENT writer on the treatment of summer diarrhœa of children remarked that, with the appearance of spring, remedies for that disease appeared in the journals as the grass upon the fields. Some wither as the grass, others blossom and bring forth fruit.

When the writer left his Alma Mater, it was with the fixed idea that opium in some form was a necessity in treating all severe attacks of diarrhœa. Unquestionably opium will control diarrhœa in the vast majority of cases, but frequently the after-effects of the drug are so bad that the last condition of the patient is as bad or worse than that from which he has been relieved. Nausea, malaise, and obstinate constipation are among these ill effects. If a method of treatment exists which will promptly relieve the diarrhœa, and at the same time be free from the objectionable effects of opium, it is obviously to be chosen.

When salol was introduced as a remedy it soon took rank as an intestinal antiseptic, as reliable as any that had been brought for-

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ward. From this fact, rather than from any specific reports upon the use of salol in diarrhœa, I several years ago began to use the drug in all forms of diarrhœa. The continued use of salol has confirmed me in the wisdom of its employment. Whereas in my earlier practice I almost universally used opium to control diarrhœa, I now as universally omit it from my prescriptions, making use of it as an adjuvant where salol fails to control the symptoms.

I believe it was Brunton who, two or three years ago, suggested that salol, in combination with some inert powder, such as chalk, acted much more efficiently in diarrhœa than when it was given alone, because the chalk absorbs the poisonous materials found in the intestine, and they are then disinfected by the salol.

It has been my practice to administer salol in 5-grain doses, combined with 10 grains of bismuth and 2 drachms of chalk mixture, as in the following prescription :

℞ Salol, ʒi;
Bismuth. subnit., ʒii;
Mist. cretæ, q.s. fʒiii. M.
Sig.—Two drachms every two hours.

Children over one year of age are given 3-grain doses of salol.

If the attack is severe, directions are given to take the same dose every hour until the diarrhœa is checked.

I have records of scores of cases relieved promptly by the above medication, the following being a fair example of a most severe attack of cholera morbus, which threatened death, and was not appreciably controlled until salol was administered :

A. S., aged 45, was suddenly seized with very severe vomiting, serous diarrhœa, and distressing pain in the abdomen. A hypodermic injection of morphine was given, followed by opium and bismuth, without the least effect, except lessening of the abdominal pain. The vomiting and serous movements continued. The stools were large and choleraic in form. Cramps in the calves were constant. The man was almost collapsed, the countenance pinched, pulse small and frequent, and the passages from the bowels constant and copious. The skin of the hands became shrivelled, and death seemed imminent. At this juncture I administered 5-grain doses of salol, with the opium and chalk mixture, and a change for the better occurred promptly. The stools at once became less frequent, lost their peculiar odor, and within twenty-four hours both vomiting and diarrhœa were controlled. The man made a good recovery, and to all appearances this was due to the timely addition of salol to the medication.

This case occurred when I first began to use salol. The attack was so severe that I was afraid to use the drug in the first place because of my lack of experience with it.

The following case is a fair example of a mild attack of cholera morbus entirely relieved by the use of the above mixture :

Samuel L., while out driving, was suddenly seized with severe vomiting and repeated large watery stools. I saw the patient one hour after the beginning of the attack, at 10 P.M. A mixture similar to the above was prescribed. The man was vomiting frequently. After three doses had been taken he went to sleep, and at four o'clock in the morning arose and went out to deliver morning papers over a long route. Neither the vomiting nor the diarrhœa returned, though the patient was necessarily weak. I had a number of times treated this same gentleman for similar attacks of equal severity with a mixture containing opium instead of salol. In every instance when he was so treated he was forced to keep his bed for two or three days, for, while the diarrhœa was controlled, the after-effects of the opium were so severe that he was entirely unable to be up.

The following case will illustrate the effect of salol upon the pain so frequently present in these attacks of cholera morbus :

Mary C.. an opium *habitué*, was seized with vomiting, diarrhœa, and distressing abdominal pain. Several ½-grain doses of morphine, administered hypodermically, were without the least effect. Stimulating hot applications were equally unavailing. I then gave 10-grain doses of salol, combined with morphine, and within two hours she was completely free from pain.

Since using salol my results in the diarrhœa of children have been far superior to what they were under my old plan of treatment.

The following case is a fair example :

Baby D., during a hot term in July, 1890, was seized with severe vomiting and diarrhœa. All milk or other liquid taken was at once regurgitated. The movements of the bowel were large, foul, and frequent. Two grains of salol, and three of bismuth in chalk mixture, were administered, and the child at once began to improve. This improvement

continued, and to-day she is a fat, hearty child of three years.

Necessarily the treatment of the diarrhœas of summer must have as their basis a rational regulation of the diet, and no drug will be of avail if the patient, whether adult or infant, be fed that which is manifestly improper.

Given this regulation of the diet, I believe that salol is probably the most efficient drug we have for the treatment of such diseases.

That it acts largely as an antiseptic I think probable, from the fact which I have repeatedly observed, that the fœtor of the stools always disappears after the use of the drug, whatever the ultimate outcome of the case.

The following case well illustrates this point:

Baby M., a child suffering from cerebral sclerosis, was attacked with severe entero-colitis. The stools were thin and watery, with the most penetrating odor imaginable; the whole house was scented by them. Administration of the usual mixture caused a disappearance of the odor within twenty-four hours. The child eventually died from exhaustion.

I believe I have never seen a case which was treated sufficiently long with salol in which the fœtor of the stools was not corrected. Its after-effects are positively *nil.* I have never in hundreds of cases seen the least untoward effect which could in any way be attributed to the salol. I consider this fact of especial importance.

In cases of severe entero-colitis the child frequently suddenly develops brain symptoms, coincident with a cessation of the stools. If opium has been administered, one is never quite sure that the drug did not have some influence in determining this result. The friends of the little patient always believe that "the disease went to the brain because the bowels were checked," and no amount of argument will convince them to the contrary, whatever the truth of the case. As salol does not have such an abrupt effect, the question of the medicine causing the brain symptoms scarcely ever comes up.

The treatment of dysentery by this method is not of value, probably because the lesion is so far down in the gut that the medicine can have no effect.

To conclude,—

1. Diarrhœa due to dietetic errors, and that which is common in adults and infants in summer, is well controlled by the administration of salol and bismuth or chalk.

2. Opium is rarely necessary where salol is used.

3. Salol controls the abdominal pain equally as well as opium.

4. It is perfectly safe, having no bad after-effects.

5. It is especially useful in the treatment of the diarrhœa of children.

6. It is of no value in dysentery.

7. It constantly corrects the fœtor of the stools.

CLIMATE IN PHTHISIS.

By Alward White, M.D., El Paso, Tex.

IN order to properly estimate the advantages to be derived from climate in the treatment of phthisis, it is necessary that we should have not only an adequate idea of the conditions we have to meet, but also an equally clear conception of the ways and means adopted by the economy to frustrate and resist the encroachments of the disease.

Assuming as a fact that phthisis is always the result of infection with the bacillus of Koch, and that the long train of symptoms that follow are but resultants of this course, we come next to inquire how best to thwart their inroads. Post-mortem examinations evidence nature's method. The pathogenic effect of the bacillus consists in its power to cause a chronic inflammation of the tissues in which it is localized, resulting in cell proliferation, emigration of leucocytes, and the formation of primary tubercle. From this stage onward, one of two courses is followed, either there results caseation, suppuration, and secondary infection, or, the microbic cause ceasing to act, degenerative changes do not occur, an impermeable wall of connective tissue is thrown around the focus of infection, the escape of bacilli or their spores into the surrounding tissue is prevented, and the further progress of the disease arrested. To promote the latter results constitutes the rational therapeutics of the disease; hence, in considering the question of climate, it must always be with a view of obtaining conditions that experience has demonstrated will best subserve this end.

Now, while it is generally conceded that climate is an important factor in the treatment of the disease, "its *modus operandi* is by no means plain." Excluding the effects

of change of scene and good hygienic surroundings, it is difficult at first glance to see how or why, if climate has a specific effect upon the progress of the disease, this result should be attained in an equal degree, in cases suffering alike, by subjecting them to the extreme opposites of climatic influences.

Thus, one of two patients in the same stage of the disease is sent on a long sea-voyage, the other to an elevated mountain region; both are benefited. In the light of such facts, we evidently cannot attribute the recovery to the greater rarefaction of the atmosphere that the mountain resort affords, nor to its increased density on the sea; and the same reasoning applies to the other conditions existing,—dryness *versus* moisture, diminished *versus* increased barometric pressure, extreme variability of daily temperature *versus* the extreme of equability, and so on to the end.

Furthermore, there is no *a priori* reason, from a physiological stand-point, why the conditions that prevail in a dry, rarefied atmosphere, with lessened barometric pressure, etc., should *per se*, any more than the opposite conditions that prevail upon the sea, exercise a beneficent influence. It seems useless to enter into a lengthy argument to prove this. One has but to reflect a moment upon the effects of altitude upon the respiratory and circulatory systems to be convinced of its truth.

Given, then, two places of resort,—one at sea-level and one at a high altitude, where the climatic conditions are diametrically opposed, yet at both of which invalids derive marked benefit,—we are driven to seek, as the only rational mode of explanation, the conditions common to both. Leaving out all minor considerations, we find one common factor,—a condition, the proper recognition of the value of which, thanks to Lister, has not only rendered his name immortal in the annals of surgery, but constitutes one of the greatest, if not the greatest, boon that the science of medicine has conferred in a century. It is hardly necessary for me to say that this common factor is the aseptic condition of the atmosphere. Aseptic both on the sea and the mountain height, both aseptic and antiseptic on the sea.

That this condition constitutes the chief therapeutic value of climatic treatment will scarcely be doubted, when we consider the facts in the case. It is the chief common factor existing at all places where invalids derive benefit. It is recognized as a *sine qua non* by all authorities, and in its application it is pretty generally agreed that the same rules which apply in modern antiseptic surgery, should also apply in the primary stage of the disease, where, in surgical parlance, the indications for treatment point in the direction of strict asepticism. Here the most benefit from altitude is derived, because we find the same *aseptic* atmosphere with which the surgeon aims to surround the patient upon whom he is going to operate, and this in recognition of the fact that all solutions of continuity are best and most speedily repaired when protected from invasion by septic influences. The parallel is almost complete between the conditions found in the primary stage of phthisis and those encountered by the surgeon in the treatment of *non-infected* wounds. On the one hand, the surgeon, when called to treat a wound already infected, directs his efforts first towards rendering the wound aseptic, and this by the use of bromine, iodine, chlorine, and ozone, all constituents of sea air. It is acknowledged by universal consent that in the second and third stages of phthisis, where infection with septic organisms has taken place, it is on the sea that the invalid derives the most benefit.

That the foregoing is the true explanation of the curative effects of climate is, to my mind, so self-evident that it needs no argument to sustain it. It belongs to that class of truths that only need enunciation in order to gain acceptance at the hands of those who are entitled to entertain views upon the subject.

Its truth has been tacitly recognized, and the principle involved applied in every *rational* specific treatment of phthisis that has been advocated in the past decade. Witness the Shurly-Gibbes method, the hypodermic use of creosote, eucalyptol, etc., and the treatment by the internal administration of iodoform, creosote, and other like remedies. I have no desire to pose in the attitude of an unbeliever in the value of climatic treatment, but I do not think any good end can be subserved by attributing the good effects to other than their proper causes,—*i.e.*, good hygienic surroundings, change of scene, plenty of sunshine, exercise in the open air, when conditions are favorable, mental diversion, relief from business cares, a moderate range of temperature, and, above all, a pure aseptic or antiseptic atmosphere, as the case demands.

PHYSIOLOGICAL ACTION OF KREATIN IN NORMAL AND TUBERCULOUS ANIMALS.

By William S. Carter, M.D.*

KREATIN, one of the waste products of muscular metabolism, is present in varying quantities in the different tissues of the body. It is found most abundantly in muscular tissue, and seems to be increased in quantity in fevers, delirium tremens, and other diseases attended with nervous disturbances. It is diminished in quantity in anæmia. Given internally, Voit † says it reappears in the urine as such or as kreatinin. Meissner ‡ found that kreatin injected directly into the circulation produces no poisonous effects. Mays § has pointed out that kreatin is a nutrient to the heart, causing the frog's heart to contract after it has become exhausted in the normal saline solution. The kreatin used in the experiments detailed in this paper was obtained in crystalline form from Liebig's beef extract, and responded to the chemical tests for kreatin. The kreatin used in cows 1, 2, 3, and 4 and in the bull, Experiment 34, was kindly loaned by Dr. Zuill. It responded to the chemical tests and was of the same as that used by Drs. Dixon and Zuill.‖ As small doses produce no effect, only one experiment on healthy animal is here detailed.

Experiment 1.—Dog; weight, 15 pounds.

Time. P.M.	Blood-pressure. mm.	Pulse. (10 sec.)	Respiration. (30 sec.)	Temperature.
12.06	124	22	12	38.6° C.
12.12 .06 gramme kreatin per jugular vein.				
12.13	112	23	12	.....
12.15	124	22	9	.....
12.20	122	19	7	.....
12.21 .06 gramme kreatin per jugular vein.				
12.22	122	19	...	.....
12.25	118	19	11	37.3° C.
12.30	126	19	6	.....
12.35	126	20	5	.....
12.40	120	20	6	36.9° C.
1.00	134	20	5	37.4° C.
1.30	132	19	5	37.1° C.
2.00	122	20	5	37.0° C.
Animal killed.				

The effect of large doses is seen in the following:

Experiment 5.—White dog; weight, 15 pounds.

Time. P.M.	Blood-pressure. mm.	Pulse. (10 sec.)	Respiration. (30 sec.)	Temperature.
12.46.00	134	23	30	Record lost.
12.47.05 .08 gramme kreatin per jugular vein.				
12 48.00	138	26	...	.....
12.48.05 .08 gramme kreatin per jugular vein.				
12.49.00	140	24	...	.....
12.49.05 .08 gramme kreatin.				
12.50.00	136	23	24	.....
12.56.00	134	23	33	.....
12.57.00 .08 gramme kreatin.				
11.58.00 .08 gramme kreatin.				
12.58.05	132	22	27	.....
12.59.00 .08 gramme kreatin.				
1.00.00	132	23	27	.....
1.00.05 .04 gramme kreatin.				
1.01.00	132	22	27	38.3° C.
1.16.00	118	19	...	.....
1.17.00 .1 gramme kreatin.				
1.17.05	124	20	...	.....
1.18.00 .1 gramme kreatin.				
1.18.05	124	19	24	.....
1.19.00 .1 gramme kreatin.				
1.19.05 .1 gramme kreatin.				
1.20.00	122	20	...	.....
1.20.05 .1 gramme kreatin.				
1.21.00	126	20	24	.....
1.23.00	122	19	21	.....
1.24.00 .2 gramme kreatin.				
1.25.00	124	20	24	.....
1.25.05 .1 gramme kreatin.				
1.26.00	126	20	21	.....
1.27.00 .1 gramme kreatin.				
1.27.05	126	20	24	.....
1.28.00 .1 gramme kreatin.				
1.28.05	126	21	21	37.8° C.
1.30.00	122	21	24	.....
1.42.00	124	20	18	37.8° C.
1.43 to 45 1 gramme kreatin.				
1.45.00	126	20	...	.....
1.46.00	124	23	18	37.8° C.
1.48.00	128	21	21	.....
1.55.00	124	20	18	37.9° C.
2.04.00	124	21	18	38.1° C.
Dog untied; walks about laboratory; does not seem at all affected by the kreatin.				
2.20.00	...	...	...	38.2° C.
4.30.00	...	...	...	40.9° C.
5.30.00	...	...	...	40.5° C.
Animal killed.				

In Experiment 5, 2.42 grammes were injected directly into the circulation, but no toxic effect resulted.

Drs. Samuel G. Dixon and W. L. Zuill ¶ say, "However, in the endeavor to determine the true nature of the active principle of the indefinite mixture, that others have entitled 'tuberculin,' we produced a crystalline substance that at once suggested the amide

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† *Zeitschrift f. Biologie*, iv., 1868.

‡ *Centralblatt für die Med. Wissenschaft*, 1866, p. 284.

§ *Practitioner*, October, 1887.

‖ *Times and Register*, Philadelphia, September 28, 1891.

¶ *Times and Register*, Philadelphia, September 28, October 17, 1891.

group,—allantoin, glycocin, tyrosin, kreatin and kreatinin, taurin, cystin, etc. With this fact directly before us, that the wasting economy, accompanied by a defective liver and weak excretory organs, is often loaded up with waste products, it was believed worth while to institute a line of physio-pathological experiments by injecting the respective members of the amide group into tuberculous animals. Kreatin being at hand, a small quantity of its solution was at once injected into tuberculous and healthy small animals, with as satisfactory results as are usually obtained with guinea-pigs and rabbits. . . . The physiological action of kreatin in tuberculous cows is so exact and identical with tuberculin that it is impossible to recognize a clinical difference. . . . The action of kreatin upon tuberculous tissue is intensely energetic, causing rapid necrosis of this tissue, giving it the appearance of having undergone a cystic degeneration."

Guinea-pigs are unsatisfactory for temperature experiments, as their temperature is continually changing. However, as experimental tuberculosis can be more easily established in them than in other animals, a few experiments are here detailed with guinea-pigs that had been inoculated * three or four weeks or more previously. The kreatin in each instance was injected subcutaneously. In every animal used post-mortem examination showed the existence of tuberculosis.

Experiment 6.—White guinea-pig.

Time.	Temperature.
11.00 A.M.	103.4° F.
11.15 .01 gramme kreatin.	
12.20 P.M.	102.4° F.
1.15 P.M.	103.1° F.
2.15 P.M.	103.6° F.

Experiment 7.—

Time.	Temperature.
11.00 A.M.	101.2° F.
11.10 A.M. .01 gramme kreatin.	
12.45 P.M.	101.2° F.
1.45 P.M.	101.6° F.
2.45 P.M.	101.6° F.

Experiment 8.—Large guinea-pig.

Time.	Temperature.
10.50 A.M.	101.6° F.
11.15 A.M. .01 gramme kreatin.	
12.15 P.M.	101.7° F.
1.15 P.M.	101.6° F.
2.15 P.M.	102.1° F.
3.00 P.M.	102.1° F.

* I am indebted to Professor John Guitéras and Dr. A. A. Ghriskey for inoculating the animals with pure cultures of tubercle bacilli.

Experiment 9.—

Time.	Temperature.
11.15 A.M.	103.1° P.
11.20 A.M. .01 gramme kreatin.	
12.25 P.M.	102.7° F.
1.20 P.M.	103.2° F.
2.20 P.M.	104.2° F.
3.00 P.M.	104.1° F.

Experiment 10.—

Time.	Temperature.
11.10 A.M.	102.2° F.
11.15 A.M. .01 gramme kreatin.	
12.45 P.M.	102.4° F.
1.45 P.M.	103.4° F.
2.45 P.M.	104.0° F.

Experiment 11.—Small guinea-pig.

Time.	Temperature.
2.00 P.M.	101.0° F.
2.30 P.M. .005 gramme kreatin.	
4.00 P.M.	101.2° F.
7.00 P.M.	101.5° F.
9.45 P.M.	101.6° F.

Experiment 12.—Small guinea-pig.

Time.	Temperature.
2.00 P.M.	101.0° F.
2.10 P.M. .005 gramme kreatin.	
3.00 P.M.	103.1° F.
4.00 P.M.	102.2° F.
7.10 P.M.	100.9° F.
10.00 P.M.	101.6° F.

Experiment 13.—

Time.	Temperature.
9.50 P.M.	102.0° F.
10.40 P.M.	102.8° F.
11.50 P.M.	101.6° F.
12.15 A.M. .03 gramme kreatin.	
12.50 A.M.	101.6° F.
1.55 A.M.	101.6° F.
2.55 A.M.	100.8° F.
3.55 A.M.	101.2° F.
4.45 A.M.	101.4° F.
5.45 A.M.	100.8° F.

Experiment 14.—

Time.	Temperature.
9.55 P.M.	103.2° F.
10.45 P.M.	102.6° F.
11.00 P.M. .02 gramme kreatin.	
12.00 M.	102.4° F.
12.50 A.M.	102.6° F.
2.00 A.M.	102.4° F.
3.00 A.M.	102.6° F.
4.00 A.M.	102.5° F.
5.00 A.M.	102.2° F.
5.50 A.M.	101.4° F.

Experiment 15.—Small guinea-pig, with advanced tuberculosis.

Time.	Temperature.
7.15 P.M.	102.6° F.
8.30 P.M.	103.0° F.
9.30 P.M.	102.4° F.
9.35 P.M. .01 gramme kreatin.	

Time.	Temperature.
10.30 P.M.	102.4° F.
11.30 P.M.	102.4° F.
12.30 A.M.	103.6° F.
1.30 A.M.	103.6° F.
3.00 A.M.	102.2° F.

Experiment 16.—Small white guinea-pig.

Time.	Temperature.
10.00 P.M.	101.6° F.
10.50 P.M.	101.6° F.
11.00 P.M. .02 gramme kreatin.	
12.05 A.M.	100.8° F.
12.55 A.M.	101.6° F.
2.05 A.M.	102.2° F.
3.00 A.M.	102.2° F.
4.00 A.M.	101.8° F.
4.55 A.M.	101.6° F.
5.55 A.M.	101.0° F.

Experiment 17.—Black guinea-pig.

Time.	Temperature.
10.05 P.M.	101.0° F.
10.55 P.M.	100.8° F.
11.00 P.M. .02 gramme kreatin.	
12.00 M.	99.9° F.
1.00 A.M.	100.8° F.
2.10 A.M.	100.6° F.
3.00 A.M.	100.6° F.
4.08 A.M.	99.5° F.
4.58 A.M.	100.0° F.
6.00 A.M.	99.4° F.

Experiment 18.—Medium-sized guinea-pig.

Time.	Temperature.
7.20 P.M.	100.2° F.
8.30 P.M.	100.4° F.
8.35 P.M. .01 gramme kreatin.	
9.30 P.M.	100.4° F.
10.30 P.M.	103.1° F.
11.30 P.M.	102.8° F.
12.30 A.M.	102.4° F.
1.30 A.M.	102.8° F.

Experiment 19.—

Time.	Temperature.
7.00 P.M.	103.0° F.
8.15 P.M.	103.0° F.
8.30 P.M. .015 gramme kreatin.	
9.30 P.M.	102.4° F.
10.30 P.M.	102.4° F.
11.30 P.M.	103.0° F.
12.30 A.M.	103.2° F.
1.30 A.M.	102.6° F.

Experiment 20.—

Time.	Temperature.
10.00 A.M.	99.6° F.
2.00 P.M.	102.0° F.
4.08 P.M.	102.4° F.
7.30 P.M.	101.5° F.
8.45 P.M.	101.4° F.
9.00 P.M. .01 gramme kreatin.	
10.30 P.M.	101.2° F.
1.00 A.M.	102.8° F.
3.00 A.M.	102.4° F.

Experiment 21.—

Time.	Temperature.
10.05 A.M.	99.1° F.
2.00 P.M.	101.0° F.
4.00 P.M.	101.8° F.
7.30 P.M.	101.0° F.
8.45 P.M.	99.8° F.
9.00 P.M. .01 gramme kreatin.	
10.30 A.M.	99.4° F.
1.00 A.M.	100.8° F.
3.00 A.M.	100.4° F.

Experiment 22.—

Time.	Temperature.
10.00 A.M.	98.6° F.
2.00 P.M.	100.8° F.
4.00 P.M.	101.8° F.
7.30 P.M.	101.5° F.
8.45 P.M.	101.2° F.
9.00 P.M. .01 gramme kreatin.	
10.30 P.M.	100.6° F.
1.00 A.M.	102.7° F.
3.00 A.M.	102.2° F.

Experiment 23.—Large guinea-pig.

Time.	Temperature.
10.00 A.M.	100.8° F.
2.00 P.M.	101.3° F.
4.00 P.M.	102.0° F.
7.30 P.M.	101.4° F.
8.45 P.M.	101.0° F.
9.00 P.M. .03 gramme kreatin.	
10.30 P.M.	100.8° F.
1.00 A.M.	103.2° F.
3.00 A.M.	102.4° F.

It will be seen that in the eighteen experiments on tuberculous guinea-pigs, seven animals showed practically no change, three gave a slight rise, four a distinct rise, and in four there was a fall of temperature. As the normal temperature of these animals is continually changing, CONSTANT and DECIDED changes of temperature must follow the exhibition of any drug in order to say that it is pyretic.

The next experiments were made on animals with local tuberculosis.

The notes of the local condition and any changes taking place were very kindly made by Dr. W. B. Jameson, who was present at these experiments.

Experiment 24.—May 8, 1892; black rabbit; inoculated with pure culture of tubercle bacilli, into anterior chamber of eye, by Dr. Ghriskey, one month before experiment.

Time.	Temperature.	Remarks.
11.00 A.M.	102.0° F.	Bulging at point of inoculation; pannus above; cheesy mass at point of inoculation; cheesy cone extends on iris to pupil; hypopion below; pupil vertically oval; anterior

Time.	Temperature.	Remarks.
		chamber deep; small globular masses are arranged in radii from the pupil, most distinct posteriorly.
1.00 P M.	102.2° F.	
3.00 P.M.	103.0° F.	
5.00 P.M.	102.8° F.	
9.00 P.M.	103.1° F.	
10.00 P.M.	.04 gramme kreatin.	
11.00 P.M.	102.8° F.	No change in local condition.
1.00 A.M.	103.6° F.	
3.00 A.M.	103.3° F.	
5.00 A.M.	103.0° F.	
7.00 A.M.	103.0° F.	

Experiment 25.—May 10, 1892; same rabbit.

Time.	Temperature.	Remarks.
10.00 A.M.	100.6° F.	Condition as described above.
2.00 P.M.	101.3° F.	
4.00 P.M.	102.0° F.	
7.30 P.M.	102.0° F.	
8.45 P.M.	.135 gramme kreatin.	
10.30 P.M.	102.6° F.	No change.
1.00 A.M.	103 4° F.	
3.00 A.M.	102.8° F.	

Experiment 26.—June 2, 1892; same rabbit as in Experiments 24 and 25.

Time.	Temperature.	Remarks.
2.30 P.M.	104.2° F.	Enormous anterior staphyloma, showing a gray mass anteriorly; ulcer near the centre; vessels posteriorly are well filled.
4.00 P.M.	103.8° F.	
6.00 P.M.	104.1° F.	
8.00 P.M.	103.6° F.	
9.30 P.M.	103.6° F.	
9.30 P.M.	.1 gramme kreatin.	
11.00 P.M.	103.0° F.	No change apparent.
12.30 A.M.	104.0° F.	
1.30 A.M.	103.8° F.	
3.30 A.M.	103.3° F.	
5.30 A.M.	103.2° F.	

Experiment 27.—June 4, 1892; same rabbit.

Time.	Temperature.	Remarks.
3.30 P.M.	102.0° F.	See condition noted two days previously.
7.00 P.M.	101.8° F.	
7.45 P.M.	.06 c.c. tuberculin.	
9.45 P.M.	101.6° F.	
11.00 P.M.	102.1° F.	Corneal ulcer injected; intense engorgement of vessels posteriorly.
12.15 A.M.	101.8° F.	
1.30 A.M.	102.2° F.	
2.45 A.M.	101.8° F.	No marked change.

Experiment 28.—June 2, 1892; white rabbit, inoculated three weeks previously.

Time.	Temperature.	Remarks.
2.30 P.M.	103.7° F.	Pannus at upper part; blood-vessels filled; area of cheesy material at upper and back part; cornea bulged, and anterior chamber shows pus in region of pupil; general peripheral injection.
4.00 P.M.	104.0° F.	
6.00 P.M.	104.2° F.	
8.00 P.M.	104.3° F.	
9.20 P.M.	103.4° F.	
9.20 P.M.	.1 gramme kreatin.	
11.00 P.M.	102.6° F.	No change in local condition.
12.30 A.M.	104.0° F.	
1.30 A.M.	103.9° F.	
3.30 A.M.	105.0° F.	
5.30 A.M.	103.6° F.	
9.30 A.M.	105.0° F.	

Experiment 29.—June 4, 1892; same rabbit as in Experiment 28.

Time.	Temperature.	Remarks.
3.30 P.M.	101.8° F.	Same condition as two days previously.
7.30 P.M.	101.5° F.	
7.45 P.M.	.04 c.c. tuberculin.	
9.45 P.M.	101.3° F.	
11.00 P.M.	101.8° F.	Peripheral injection *very deep*, leaving a central area almost free, 7 mm. in vertical by 9 mm. in horizontal diameter.
12.15 A.M.	101.4° F.	
1.30 A.M.	101.3° F.	
2.30 A.M.	100.8° F.	No change.

Experiment 30.—June 2, 1892; gray rabbit; inoculated three weeks previously.

Time.	Temperature.	Remarks.
2.30 P.M.	103.5° F.	Injection slight in a narrow band over conjunctiva, from upper margin down to cornea; fan-shaped pannus over small area at upper margin of cornea; dense gray collection under centre of cornea; line of tubercles on anterior segment of iris, but vessels not visible.
4.00 P.M.	103.3° F.	
6.00 P.M.	103.2° F.	
8.00 P.M.	103.8° F.	
9.25 P.M.	103.3° F.	
9.25 P.M.	.1 gramme kreatin.	
11.00 P.M.	102.8° F.	No change apparent in local condition.
June 3, 1892.		
12.30 A.M.	103.0° F.	
1.30 A.M.	103.5° F.	
3.30 A.M.	103.4° F.	

Time.	Temperature.	Remarks.
5.30 A.M.	103.0° F.	
9.30 A.M.	103.4° F.	
1.30 P.M.	103.9° F.	
4.00 P.M.	104.0° F.	
6.00 P.M.	103.0° F.	
8.00 P.M.	102.8° F.	
8.30 P.M.	.1 gramme kreatin.	
9.30 P.M.	102.3° F.	No change.
11.00 P.M.	102.0° F.	

Experiment 31.—June 4, 1892; same gray rabbit as in Experiment 30.

Time.	Temperature.	Remarks.
3.30 P.M.	101.0° F.	Same condition as detailed two days previously.
7.00 P.M.	100.4° F.	
7.00 P.M.	.04 c.c. tuberculin.	
9.45 P.M.	100.2° F.	
11.00 P.M.	101.2° F.	Vessels are NOW visible throughout iris; fan-shaped collection of vessels show increased engorgement.
12.15 A.M.	100.4° F.	
1.30 A.M.	100.9° F.	
2.45 A.M.	100.0° F.	Pannus not so marked, nor are the blood-vessels in iris so distinct as they were at 11 P.M.

These experiments show that kreatin has no effect on local tuberculosis, while tuberculin produces a very distinct active hyperæmia, but no constitutional reaction.

Through the courtesy of Professor Leonard Pearson I was permitted to make a number of experiments (see opposite page) on tuberculous cattle under his care in the Veterinary Hospital of the University of Pennsylvania.

All of these cattle gave distinct reactions with tuberculin, as is shown in the following:*

Cow 1.—

Time.	Temperature.
6.30 P.M.	101.4° F.
.3 c.c. tuberculin.	
12.35 A.M.	102.8° F.
3.20 A.M.	103.2° F.
6.30 A.M.	105.2° F.

Cow 2.—

Time.	Temperature.
6.40 P.M.	101.6° F.
.25 c.c. tuberculin.	
12.45 A.M.	102.0° F.
3.30 A.M.	102.4° F.
6.30 A.M.	103.4° F.

* Dr. Pearson has kindly given me permission to publish the temperature reactions and the notes of the autopsies of these cattle.

Cow 3.—

Time.	Temperature.
5.00 P.M.	101.2° F.
6.00 P.M.	.25 c.c. tuberculin.
7.00 P.M.	101.0° F.
9.00 P.M.	101.5° F.
11.00 P.M.	101.2° F.
1.00 A.M.	101.5° F.
3.00 A.M.	102.3° F.
5.00 A.M.	103.2° F.
7.00 A.M.	103.6° F.
9.45 A.M.	104.6° F.
11.00 A.M.	104.4° F.

Cow 4.—

Time.	Temperature.
7.00 P.M.	101.4° F.
.25 c.c. tuberculin.	
3.00 A.M.	102.0° F.
6.00 A.M.	104.0° F.

Bull.—

Time.	Temperature.
10.15 P.M.	102.6° F.
.25 c.c. tuberculin.	
1.15 A.M.	101.4° F.
4.45 A.M.	102.6° F.
8.30 A.M.	106.0° F.

Heifer.—Miliary tuberculosis.

Time.	Temperature.
6.30 P.M.	104.4° F.
6.40 P.M.	.125 tuberculin.
3.00 A.M.	106.0° F.
6.00 A.M.	106.0° F.

There can be no question as to the existence of tuberculosis in the animals experimented upon, for post-mortem examination disclosed the following conditions:

Cow 1.—Two large, cheesy, tubercular masses, larger than hens' eggs, were found at the apex of the left lung. The mediastinal and bronchial glands were enlarged and calcified. The inguinal glands enlarged, and contained a few tubercles. The mesenteric glands were considerably enlarged, and contained yellow, tubercular masses.

Cow 2.—The bronchial glands were enlarged and decidedly tubercular. The lungs show several large tuberculous areas at the margin of the right lower lobe, and numerous small areas throughout the entire right lung. There was one small area in the left lung. There were a few small tubercles in the liver. The inguinal glands were enlarged and tubercular. Some calcified tubercles were found beneath the serous coat of the intestines.

Cow 3.—The upper lobe of the left lung was entirely filled with miliary tubercles. It also contained several caseous nodules as large as hazel-nuts. The middle lobe of the right lung was thickly studded with large and

Experiment 32.—April 30, 1892.

NORMAL TEMPERATURES FOR TWENTY-FOUR HOURS.

Time.	Cow 1.	Cow 2.	Cow 3.	Cow 4.	Bull.	Heifer.
7.00 A.M.	101.4° F.	101.6° F.	102.0° F.	101.4° F.	101.6° F.	105.0° F.
9.00 A.M.	102.1° F.	101.3° F.	101.6° F.	101.2° F.	102.1° F.	105.8° F.
11.00 A.M.	102.0° F.	101.3° F.	102.3° F.	101.6° F.	102.2° F.	105.3° F.
1.00 P.M.	101.6° F.	101.7° F.	102.3° F.	101.4° F.	101.8° F.	105.2° F.
3.00 P.M.	102.0° F.	101.6° F.	102.3° F.	101.3° F.	102.0° F.	105.7° F.
5.00 P.M.	102 0° F.	101.0° F.	102.0° F.	101 5° F.	102.1° F.	105.0° F.
7.00 P.M.	101.8° F.	101.6° F.	101.9° F.	101.6° F.	101.8° F.	105.0° F.
9.00 P.M.	101.4° F.	101.5° F.	101.7° F.	101.7° F.	102.6° F.	105.2° F.
11.00 P.M.	101.4° F.	101.6° F.	101.2° F.	101.4° F.	101.8° F.	104.4° F.
1.00 A.M.	101.4° F.	101.2° F.	101.7° F.	101.2° F.	101.6° F.	104.9° F.
3.00 A.M.	101.2° F.	101.7° F.	101.6° F.	100.8° F.	101.6° F.	104.7° F.
5.00 A.M.	101.5° F.	101.6° F.	102.0° F.	101.5° F.	101.4° F.	104.4° F.

NOTE.—Experiment 32 shows the normal temperature to be rather constant. However, a greater diurnal change is seen in the following:

Experiment 33.—May 3, 1892.

Time.	Cow 1.	Cow 2.	Cow 3.	Cow 4.	Bull.	Heifer.
7.00 A.M.	101.6° F.	101.7° F.	101.0° F.	101.5° F.	101.5° F.	105.5° F.
9 20 A.M	101.5° F.	101.8° F.	102.7° F.	101.0° F.	102.0° F.	105.7° F.
11.00 A.M.	101.0° F.	101.2° F.	101.0° F.	101.5° F.	101.6° F.	105.5° F.
1.30 P.M.	101.1° F.	101.5° F.	101.7° F.	101.5° F.	101.7° F.	105.8° F.
3.00 P.M.	101.3° F.	101.4° F.	102.2° F.	102.0° F.	102.0° F.	105.6° F.
5.00 P.M.	101.6° F.	102.0° F.	103.8° F.	101.6° F.	101.9° F.	105.6° F.
7.00 P.M.	101.9° F.	102.7° F.	102.6° F.	102.0° F.	102.5° F.	105.8° F.
9.00 P.M.	102.2° F.	102.4° F.	102.2° F.	102.1° F.	101.2° F.	105.3° F.
11.00 P.M.	102.1° F.	102.0° F.	101.1° F.	101.7° F.	101.8° F.	105.4° F.

Experiment 34.—May 5, 1892.

Time.	Cow 1.	Cow 2.	Cow 3.	Cow 4.	Bull.	Heifer.
9.00 A.M.	101.1° F.	101.0° F.	100.7° F.	101.3° F.	101.5° F.	105.7° F.
11.00 A.M.	101.8° F.	101.1° F.	101.8° F.	101.6° F.	101.8° F.	105.3° F.
1.00 P.M.	101.6° F.	101.1° F.	101.4° F.	101.5° F.	101.5° F.	106.0° F.
3.00 P.M.	101.4° F.	101.7° F.	101.2° F.	101.2° F.	101.8° F.	105.0° F.
5.00 P.M.	101.4° F.	101.2° F.	101.7° F.	101.3° F.	101.9° F.	105.6° F.
8.00 P.M.	101.2° F.	101.8° F.	102.4° F.	101.3° F.	101.6° F.	105.2° F.
9.30 P.M.	.1 gramme kreatin.	.1 gramme kreatin.	.1 gramme kreatin.	.1 gramme kreatin.	.1 gramme kreatin.	.1 gramme kreatin.
10.00 P.M.	101.8° F.	102.3° F.	101.6° F.	100.6° F.	101.7° F.	105.5° F.
12.00 M.	101.6° F.	102.2° F.	101.1° F.	100.8° F.	101.8° F.	105.0° F.
2.00 A.M.	101.6° F.	102.1° F.	101.4° F.	101.0° F.	101.2° F.	105.4° F.
4.00 A.M.	101.7° F.	101.8° F.	101.4° F.	101.3° F.	101.5° F.	105.3° F.
6.30 A.M.	101.4° F.	101.7° F.	101.3° F.	101.2° F.	101.9° F.	105.1° F.

Experiment 35.—

Time.	Cow 1.	Cow 2.	Cow 3.	Cow 4.	Bull.	Heifer.
9.00 A.M.	101.1° F.	100.9° F.	102.2° F.	101.1° F.	101.6° F.	106.1° F.
11.00 A.M.	100.7° F.*	100.6° F.*	101.2° F.*	99.2° F.*	100.1° F.*	103.7° F.*
1.00 P.M.	101.3° F.	101.0° F.	101.6° F.	100.4° F.	100.4° F.	105.1° F.
3.00 P.M.	101.1° F.	101.5° F.	101.6° F.	101.5° F.	101.2° F.	105.1° F.
5.00 P.M.	101.5° F.	101.4° F.	101.5° F.	101.0° F.	101.8° F.	106.2° F.
7.00 P.M.	101.6° F.	101.5° F.	101.5° F.	101.0° F.	101.2° F.	106.0° F.
9.00 P.M.	101.5° F.	101.5° F.	101.6° F.	100.8° F.	101.5° F.	105.6° F.
10.00 P.M.	.2 gramme kreatin.	.2 gramme kreatin.	.2 gramme kreatin.	.2 gramme kreatin.	.2 gramme kreatin.	.1 gramme kreatin.
11.00 P.M.	101.4° F.	101.0° F.	101.0° F.	100.6° F.	101.8° F.	106.2° F.
1.00 A.M.	101.6° F.	101.5° F.	101.0° F.	100.8° F.	101.2° F.	105.6° F.
3.00 A.M.	101.7° F.	101.2° F.	100.8° F.	100.9° F.	101.0° F.	105.4° F.
5.00 A.M.	101.8° F.	101.4° F.	101.1° F.	100 8° F.	101.0° F.	105.5° F.
7.00 A.M.	101.3° F.	101.2° F.	100.8° F.	100.6° F.	101.4° F.	105.5° F.

* The attendant unwittingly watered the cattle at this time, thus causing the sudden fall of temperature.

small tubercles. The bronchial glands were much enlarged, caseous, and calcareous. A few small tubercles were found in the liver. The mesenteric glands were tubercular.

Cow 4.—Throughout both lungs there were numerous tubercular masses, varying in size from that of a hazel-nut to that of a goose-egg. The bronchial glands were very much enlarged, caseous, and calcareous. Mediastinal glands were enormously enlarged, cheesy, and calcareous, forming a mass six inches in length by three inches in thickness. Liver contained nu-

merous small nodules, varying in size from that of a shot to that of a pea. Mesenteric glands enlarged and tubercular.

Bull.—A softened, tubercular mass, as large as a goose-egg, was found beneath the serous covering of the apex of the right lung. There were a few small tubercles in the right lung. The mediastinal and bronchial glands were enlarged and tuberculous. The mesenteric glands were enlarged, and contained softened tuberculous masses as large as beans.

Heifer.—Died of miliary tuberculosis. Both lungs were filled throughout with miliary tubercles. The mediastinal glands were greatly enlarged and tuberculous. Post-pharyngeal glands were tubercular. A few tubercles were found in the liver. The mesenteric glands were enormously enlarged and tuberculous.

From these experiments it appears that kreatin has no action on tuberculous animals. The doses given were larger than those given by Drs. Dixon and Zuill. They do not report in detail their experiments with kreatin, but in those with tannin they state that the injection was made in the morning, and in every case the rise in temperature occurred in the evening from 7 to 9 P.M.

It is well known that there is a diurnal change of temperature in normal animals, the minimum occurring in the morning and the maximum at about 4 or 5 P.M.* The temperature remains high until 9 P.M., from which time it falls until morning. This rhythm is also present in fevers. In tuberculosis, especially if the disease is advanced, there is often a pronounced evening elevation of temperature (Friedberger and Fröhner). From the conclusions arrived at by Dixon and Zuill, it would seem that, at the time of writing their paper, they had not taken into consideration this diurnal change in temperature which occurs in animals, and mistook the normal evening rise of temperature for a reaction.†

In the experiments detailed in this paper, it will be observed the injections were usually made IN THE EVENING. With kreatin there was no change of temperature, but with tuberculin there was a distinct reaction, at a time when the temperature would normally be falling.

* Professor J. Tereg, *Die Lehre von der Thierschen Wärme*. Professors F. Friedberger and E. Fröhner, *Lehrbuch der Klinischen Untersuchungsmethoden*.

† In Cow 3, Experiment 33, there was a marked evening rise of temperature.

THE SYMPTOMS, COMPLICATIONS, AND TREATMENT OF DYSENTERY.

BY A. BRAYTON BALL, M.D.‡

Concluded from page 448.

THE treatment of dysentery hitherto has been almost wholly symptomatic and empirical, and must remain so until we have differentiated its several infectious causes, and discovered means for destroying them. In the mean time is it not possible that the contrariety of opinions as to the value of particular remedies is due, in part, to the fact that in dysentery we have to deal with a number of distinct affections, and that a drug valuable in one infectious form may be comparatively useless in others?

The Ipecac Treatment.—The recent revival of the ipecac treatment for dysentery is quite as remarkable as its episode as a quack remedy in the seventeenth century. The treatment by large doses was introduced into India, about thirty years ago, by Mr. Scott Docker,[a] surgeon to the Second Battalion of the Seventh Royal Fusiliers, and rapidly came into favor, superseding almost at once the old plan of bloodletting and mercurialization. It is often referred to, especially by German and French writers, as the emetic treatment, but this is a misconception of it, as the avoidance and control of emesis form an important part of the treatment. 20 or 30 drops of laudanum, or an equivalent dose of some other preparation of opium, may be given for this purpose half an hour before the administration of the ipecac, but some authorities regard this as unnecessary, and as interfering with the desired effects of the drug. A mustard poultice large enough to cover the entire surface of the abdomen is applied, and after its full action, 20 to 30 grains of ipecac are given, with only sufficient water to wash down the dose. The patient must lie flat on his back, with the head low, keep absolutely quiet, and refrain from talking for three hours, during which time no food or liquid is to be given, except some cracked ice, or an occasional teaspoonful of water, if the thirst be unbearable. Counter-irritation of the abdominal surface is to be kept up, either by another mustard poultice or, still better, by a sheet of spongiopiline wrung out of hot water. Under this management it is claimed that, while there is al-

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ways nausea, vomiting is generally avoided, or is delayed long enough to permit absorption of the drug. If vomiting occur early, the dose should be repeated after a suitable delay. Eight or ten hours later another, but smaller, dose is given, and this double daily dose, in gradually reduced quantities, is repeated morning and evening for two or three days until the dysenteric symptoms have yielded or fail to respond to the treatment. The best results are obtained during the early days of the illness, before ulcerative processes have begun, but even in chronic dysentery the acute exacerbations are said to be controlled by it, and as Professor Maclean testifies from his own experience, most happy effects are sometimes obtained in apparently hopeless adynamic cases.

In 1868, a decade after the introduction of this treatment into India, the writer just mentioned says that "this system of treating acute dysentery is now almost invariably followed in India;" that it has reduced the former mortality by from twenty-five to seventy-five per cent., according to different reports, and that in his opinion it is "the most simple, the most successful, the most conservative, and the least distressing mode of treatment I have ever seen used in dysentery. Year by year, under its use, the number of chronic cases is becoming smaller, and hepatic abscess is less frequently seen." In 1883, Joseph Ewart,[29] after a long experience with this treatment in India, speaks of it with the same enthusiasm, and says, "that every physician who has used ipecac in heroic doses soon learns that depression of the vital powers is not to be feared, and is surprised at the small amount of vomiting that follows its administration." At the same time he admits the occasional occurrence of uncontrollable sickness and vomiting, but says it is seldom witnessed, except in connection with such complications as abscess of the liver, malarial poisoning, splenic and liver affections, Addison's disease, Bright's disease, phthisis, peritonitis, or extensive intestinal sloughing,—a list of possibilities that is anything but reassuring. Abundant testimony of an equally favorable character might be cited from other writers in India; but of late years physicians in that country have become less enthusiastic about the advantages of large doses and more apprehensive of their depressing effects. Surgeon-Major S. T. Dobie[30] says that the treatment by large doses has fallen into disfavor. Chowdhovry[31] says that both in civil hospitals and in private practice it has been found unbearable in many cases, and that the constant sensation of nausea which worried the patients undergoing this treatment interfered greatly with their taking nourishment. Neither of these writers has lost faith in the ipecac treatment, but advocates its use in much smaller doses.

In England, where dysentery is now so uncommon that few physicians there have had much experience with it, the treatment has been but little used, though as recently as 1888, C. Hanfield Jones[32] speaks of it as *facile princeps medicamentorum* in dysentery. Dr. Clouston's results from it in the epidemic already mentioned was very unsatisfactory. He says that he used it in the earliest stages of the disease, and in every possible way, by the mouth and by the rectum, in doses of from 10 grains to a drachm; gave the drug alone or in combination with opium and after opium; administered it once a day or every two hours, and the result was a mortality of twenty out of thirty-one cases. In a few instances the drug caused vomiting that could not be stopped and prostration that was never rallied from. Sometimes it caused no sickness, even in large doses, and then it diminished the quantity of blood in the evacuations, while in the majority of cases it produced temporary nausea, without doing harm or good.

In this country the treatment has never secured a firm foothold. During the civil war favorable results were reported by a few surgeons in the field, but trials of it, more especially in chronic cases, at the Eckington Hospital, Washington, D. C., and later in Columbia, S. C., in 1868, were disappointing. Since then successful cases have been reported from time to time in medical journals, but the treatment has never met with general adoption, partly on account of the frequency with which depressing effects have been met with, and partly because the superiority of this over other less objectionable methods has not been demonstrated for the dysenteries of this country.

As to the great value of this treatment in certain cases there is no doubt whatever. In such instances ipecac in heroic doses, given particularly in the initial stage, has seemed to act almost as a specific, promptly relieving the tormina and tenesmus, producing bilious, feculent stools, and arresting the further progress of the disease. Such reports come to us chiefly from tropical and subtropical regions, where dysentery is very frequently of amœbic origin, and possibly systematic exam-

ination of the stools in amœbic dysentery in connection with this treatment may show that ipecac has a special relation to this form of dysentery. Many recent writers who discard the large doses recommend the drug in amounts sufficient only to excite slight nausea (2 or 3 grains), or in still smaller doses, ¼ grain every half-hour, as suggested by Loomis. My own preference has been for this method.

From the earliest use of *opium* in dysentery down to the present time there has been a long-standing controversy as to the therapeutic value of the drug in dysenteric affections. By one school of writers its use has been limited to the relief of pain, to moderating the frequency of the dejections, and to procuring sleep. By the opposing school, opium, it is claimed, has not only these advantages, but also directly controls the inflammatory process. The history of this dispute is very interesting, but I can touch upon only a recent aspect of it. Probably nowhere else in the world is opium used with so much freedom in dysentery as in this country. This is due largely to the influence of the writings of Chapman,[33] George Wood,[34] Stillé,[35] Flint,[36] and Loomis,[37] all of whom have been strong advocates of the view that in dysentery opium has marked antiphlogistic virtue. Flint leaves us in no uncertainty as to his own convictions. "In sporadic dysentery," he says, "after purgation, opium in some form is the remedy to be most relied upon." Other remedies are suggested, but merely as adjuvants or to replace opium, when from some idiosyncrasy it is not tolerated. In epidemic dysentery the great object, he holds, is to arrest the sero-sanguinolent dejections. Purgatives, especially of the saline class, may be used cautiously, but opium is to be the main reliance, associated with various astringents, but with these as merely auxiliary. The dosage of opium or morphine is to be measured by its effect in checking the discharges, care being taken, of course, that profound narcotism is not induced; but with this precaution, if the dejections be not controlled by small doses, these may be increased "to the amount which will be borne without narcotism, be the amount never so large," even to twenty-four grains of morphine in the twenty-four hours, as in one of Flint's cases.

Loomis takes the same view as to the antiphlogistic value of opium in dysentery, and advises that it be given up to the point of semi-narcotism. Independently of its narcotic, sedative, and astringent effects, he maintains that it controls the inflammatory process by its action on the sympathetic nervous system.

On the other hand, to cite only a few recent authorities, Trousseau says, "When opium is indicated it is not for the purpose of stopping the intestinal flux, but for moderating the accompanying pains, and particularly for checking the vomiting, which renders the administration of other medicines impossible." Heubner[38] opposes the methodical use of opium in dysentery, and recommends it only as a temporary and palliative remedy. Joseph Ewart, after his long experience with the disease in India, says that opium is seldom required; that it checks the secretions of the liver, pancreas, and alimentary mucous membrane; favors rather than reduces the inflammation of the solitary and tubular glands, and masks the real character of the disease by inducing an apparent amendment of symptoms, while destructive ulceration and sloughing of the mucous membrane is rapidly extending. Woodward, who had a better opportunity than any one else in this country of estimating the value of the opium treatment of dysentery during the civil war, says, "For myself I freely confess that I went into the field at the beginning of the war in favor of the use of opium in all the alvine fluxes, which experience was very speedily modified. When I published my 'Outlines of the Chief Camp Diseases,' in the latter part of 1863, I still favored its employment in a more liberal manner than I now approve, but already at that time I insisted that opiates should not be regarded as 'specific or curative agents,' either in acute dysentery or the chronic fluxes."

In the milder grades of dysentery, it probably makes but little difference whether opium be used or not, except so far as the comfort of the patient is concerned. These cases recover, as Flint himself has shown, with a mere placebo treatment in about the same time as when subjected to various forms of active medication. The problem is a very different one, however, when we have to deal with adynamic forms of infectious dysentery, in which, as in puerperal peritonitis, the profoundly depressed nervous system often manifests an extraordinary insusceptibility to the toxic action of opium. Flint's case has been already cited. To it may be added, as a recent illustration, Dr. Wright's patient, who received 24 grains of opium by the mouth, 30 grains by suppository, and 1½ grains of morphine hypo-

dermically in one day without symptoms of narcotism or other unpleasant effects. Such a use of opium, it must be admitted, has the sanction of high authority, but there is no satisfactory evidence in its favor. What reason is there to suppose that in croupous and amœbic inflammations of the colon opium has a direct influence in controlling inflammatory processes that we do not admit for it in typhoid infection of the small intestine or in diphtheria of the throat? The use of opium in dysentery as an antiphlogistic is not based on known properties of the drug, and the mere fact that patients survive even large doses does not counteract the strong objections to such an employment of it. It destroys the appetite, impairs digestion, favors the retention of decomposing and fermenting products, and can be justified only by a clear demonstration of its superiority over other less hazardous methods. Such proof we certainly do not possess. In dysentery, as in other affections attended by excessive fluxes and severe pain, opium is of unquestionable value in moderating these symptoms, but it is most important to bear in mind that the cure of disease is not to be effected by mere suppression of its symptoms. Sixteen hundred years ago, Galen[39] warned the medical profession of his time that "those who resort to anodyne remedies at improper times or immoderately, jugulate the sick along with their pains." For my own part, experience has taught me more and more to distrust the fallacious effects of opium in dysenteric diseases, and I am quite sure that this conclusion is in accord with the opinion of most recent authorities.

The treatment by *purgatives* followed naturally upon the observation that acute colitis, at least in its early stage, is really a constipating affection,—a *morbus alvum occludens*, as Stoll called it; and that reappearance of fæcal dejections is usually an indication of approaching resolution of the inflammation. In one form or another this treatment has been in use from the earliest times, and has unquestionable advantages. Besides removing scybala and other irritating material, it produces, when properly used, a sedative effect upon the inflamed intestine, as shown by the marked relief of tormina. Whether it also directly modifies the inflammatory process by a supposed alterative action, or by depleting the intestinal blood-vessels, is questionable. Certainly the practice of daily purgation with this object in view is much less common now than formerly. Probably most, if not all, of the good effects from purgatives come from the cleansing of the intestinal canal. For this purpose it probably matters but little which of the milder purgatives is used. Some prefer the salines,—sulphate of magnesium, sulphate of sodium, Rochelle salt, or a seidlitz powder, others castor oil. The latter is disagreeable to sensitive stomachs, and has no special advantages. Purgation in acute cases every second or third day is all that is required. It is objectionable in adynamic cases, and unnecessary in the not infrequent cases with diarrhœal rather than dysenteric dejections.

As regards *calomel*,—which has played so important a part in the treatment of dysenteric affections during the first half of the present century,—perhaps no better illustration of the general disfavor into which it has fallen of late years can be given than the absence of even any allusion to it by my friend Dr. Osler[40] in his remarks on the treatment of dysentery, in his work on the "Principles and Practice of Medicine," published during the present year. Some of us remember vividly the order issued by Dr. W. A. Hammond in 1863, then surgeon-general of the army of the United States, withdrawing calomel from the list of medicines supplied to the army, on the ground of the bad results following the indiscriminate use of this drug, particularly in the alvine fluxes, as well as the strong protests against this order made by many army surgeons and by the American Medical Association. The present reaction against the systemic use of calomel in dysentery, at least in this country, seems to be due partly to the unfortunate results from it during the civil war and partly to the practical abandonment of it in India, and the better success there with other remedies; but chiefly, it seems to me, to the growing scepticism as to either the antiphlogistic or cholagogue properties formerly ascribed to this drug. How far this sceptical attitude is justified, by recent destructive criticism on both of these points, I am not prepared to say. Probably the reaction has gone too far, and we are in danger of losing a valuable remedy in dysentery simply because bad results have followed the misuse of it. As an occasional purgative in sthenic cases, or used systematically in doses small enough to prevent depressing effects or risk of salivation, calomel is still highly recommended by some authorities. I have had no experience with this treatment. H. C. Wood[41] says that in his

hands it has yielded better results in acute sthenic dysentery than any other remedy.

Corrosive sublimate has been recommended highly by a few writers, particularly by Kopp,[42] in 1827, Parkes,[43] in 1846, and recently Ringer.[44] That this drug has a special relation to the colon, the glandular structures of which probably take the chief part in its excretion, is shown by the fact that after its absorption in poisonous quantities through other channels than the alimentary canal, as, for instance, by the skin, vagina, uterus, and wounded surfaces, the most conspicuous lesion is an ulcerative colitis closely resembling that of diphtheritic dysentery. Its mode of therapeutic action in this disease is unknown. When given in medicinal doses, the amount excreted by the intestinal glands is probably too small for a germicide effect, and it is more reasonable to suppose that it acts either as a local alterative,—a convenient term for concealing our ignorance,—or by rendering the soil infertile for the growth of infectious organisms. As Ringer has pointed out, the best results are obtained in acute cases, especially those in which the stools are bloody and slimy. It should be given in small doses ($\frac{1}{120}$ to $\frac{1}{60}$ grain hourly), with or without one or two drops of laudanum.

Bismuth subnitrate in large doses, as recommended by Monneret,[45] is probably useless for arresting the morbid process in its early stage, but when the stools have become diarrhœal in character, this remedy has a certain value from its sedative, astringent, and possibly its antiseptic effects. Monneret advised very large doses, from an ounce and a half to two ounces daily, but equally good effects are obtained with a much smaller dosage. With large doses, one should be sure that the article is pure and free from adulteration with arsenic.

Within the past few years very favorable reports have been made of successful results with salol in acute dysentery. Dr. W. P. Nicolson,[46] Professor of Anatomy in the Southern Medical College, at Atlanta, Ga., says that he has had ample opportunity of testing this remedy, and that since he began using it he has found the resort to any form of opium unnecessary. Given in 5-grain doses every hour in the early stage, he claims that it rapidly relieves the griping and tenesmus, and restores the patient to a condition of comparative comfort.

Nitrate of silver, the solution of the pernitrate of iron, tannic and gallic acids, catechu, krameria, and hæmatoxylon are useless, and may be even injurious in acute dysenteric affections, but are often valuable in their chronic forms.

The *local treatment* by topical applications to the rectum, or by flushing the entire canal below the ileo-cæcal valve, has grown rapidly in favor of late years. There are few difficulties attending either plan, except during the early acute stage; but, unfortunately, this is just the period when local methods are most needed to arrest the local process and diminish the danger of constitutional infection. Trousseau says that the tenesmus of dysentery is not due to spasmodic contraction of the sphincter, and that he has often demonstrated to students that "the anus, in place of being tight and closed, is sufficiently open to allow the five fingers to be introduced," the tenesmus and acute burning sensation being due to the violent irritation and swollen condition of the mucous membrane rather than to a tight constriction of the sphincter. This is, doubtless, the case after some days of illness, when the sphincter muscle has been more or less paralyzed by the inflammation of the contiguous mucous membrane; but for the very outset of a dysenteric attack, the statement is incorrect, as at this period there is often a constriction of the anal orifice and an exquisite tenderness, that interferes seriously with the use of enemata, large or small. To relieve tenesmus, or to prepare the way for effective enemata, we may use suppositories of ice, or suppositories containing four per cent. of iodoform, as recommended by H. C. Wood;[47] or a teacupful of warm water, with twenty to forty drops of creosote, retained for a few minutes (Tipton[48]); or a starch and laudanum solution, or a cocaine suppository, or a small injection containing ten drops of a four per cent. solution of cocaine. For thorough irrigation of the rectum and lower part of the colon, the best apparatus is a double rubber tube, or two catheters introduced side by side (Dr. W. W. Johnston[49]); but by this method the irrigation extends at most but a few inches beyond the end of the instrument, as the water escapes nearly as fast as it is injected. This may be all that is required for the cases in which the lesions are confined to this region, but as we can never be certain how far the morbid process extends, large enemata are to be preferred when they are practicable. The patient may lie either on his back or on his side, with the hips raised by a high pillow so as to favor the flow of the fluid into the intestine by gravitation. A large, soft

catheter, or a small rubber œsophageal tube, connected by tubing with a funnel, and with a small roller bandage wound around the terminal tube, eight or ten inches from its distal end, to serve as a plug for preventing the escape of the enema, is introduced, well oiled, into the rectum until arrested by the bandage, which is to be pressed firmly against the anus. The funnel is then raised not more than two or three feet, so as to allow the fluid to flow in very gradually with a low hydrostatic pressure, and the connecting tube is compressed from time to time to permit the intestine to adapt itself to the distending process. To irrigate the entire colon, from three to four pints are necessary. Unless the bowel be very sensitive this amount can usually be given without much difficulty by the gradual method. Large enemata are tolerated best soon after a movement of the bowels. The first one should be given by the physician himself or a competent assistant; later ones may be intrusted to a nurse who can be relied upon to follow the method strictly. Irrigations may be carried out either with pure water or with medicated solutions. If water alone be used, it may be given very hot or very cold. In acute sthenic cases, ice-water injections have proved very effective, but in adynamic or chronic conditions hot water is preferable. In either form large enemata of simple water have a very happy effect in many cases, quieting the tormina and tenesmus, and diminishing the frequency of the dejections. In fact, the favorable reports with medicated solutions have been due in large measure to the sedative action of the heat or cold, and to the mere removal of irritating material from the surface of the mucous membrane.

With medicated solutions the best results have been obtained with corrosive sublimate, nitrate of silver, quinine, alum, and creolin. Lemoine[50] reports marked success with mercuric bichloride solutions 1 to 5000 and 1 to 3000 thrice or twice daily in fifty-four cases, both acute and chronic, at the Military Hospital in Oran, Algeria. In the acute cases the enema was preceded by the application to the anus of a pad saturated with a strong solution of cocaine. The injections invariably relieved the tenesmus, the mucous stools disappeared after three or four days, and no case was followed by stomatitis or other evidence of mercurial poisoning. Careful examination of the urine in five cases failed to show the presence of mercury, and from this observation Lemoine concludes that the drug is not absorbed in dysenteric inflammations, whatever may be true of physiological conditions of the colon. In the strength of the solution, and in the small quanity (six ounces) employed by Lemoine, bichloride enemata may be entirely safe, but it by no means follows that they are free from danger in amounts necessary to flush the entire colon, as this would necessitate the use of from eight to ten grains of the drug. In view of the occasional occurrence of sublimate colitis from irrigation of mucous surfaces with bichloride solutions, the safer plan would be to first flush the colon with water and then give a half-pint mercuric enema.

In amœbic dysentery solutions of quinine 1 to 5000, 1 to 2500, and 1 to 1000 have been used by Councilman and Lafleur in five cases. The treatment was suggested by Lösch's[51] observation that outside of the body the amœbæ were killed by a quinine solution 1 to 5000. In three of the cases "the amœbæ disappeared from the stools after a more or less prolonged use of the injections," but returned in small numbers when they were discontinued. In the fourth case, fatal from hepatic abscess, the injections were stopped on account of the patient's hopeless condition, and in the fifth, which was still under observation, "the amœbæ were quite as numerous as when the treatment was first instituted." A pint or a quart of the quinine solution was injected thrice daily with the patient in the knee and elbow position, the enema being retained for fifteen minutes and followed by friction along the course of the colon. These injections, the writers claim, do destroy the amœbæ in the contents of the bowel, but whether they do so in the tissues they admit is an open question, and suggest a further trial, particularly in incipient stages of the disease.

My own experience with this treatment is limited to the following case, which is particularly interesting as showing that, while amœbic dysentery is commonly a tropical affection, it may originate even as far north as Winnipeg, Canada. The patient, a Scotchman, who had lived in that city for two years, was attacked last August with a simple diarrhœa, which, after two or three weeks, was followed by dysenteric symptoms,—mucus, bloody discharges, tenesmus, and tormina. He was confined to bed for a month with this acute attack, which the patient says was unaccompanied by fever, and then for the next four months the diarrhœa was followed by constipation in alternating periods of two

or three weeks' duration. In April, after a month's freedom from diarrhœa, he left Winnipeg to take a steamer at New York for Glasgow, Scotland. On the way he had a relapse, and when admitted to New York Hospital, April 27, was having from three to six stools daily, containing mucus, no blood, fæcal matter, and a large number of amœbæ. He was put upon a milk and meat diet, with salol in 5-grain doses three times daily and an enema of two quarts of a quinine solution 1 to 3000, later 1 to 5000, morning and evening. Under this treatment the stools, which were examined almost daily by Dr. Frank Ferguson, the pathologist of the hospital, did not diminish in frequency, but the amœbæ gradually disappeared, first the live ones, then even the dead ones. On May 5, salol was changed for bismuth subnitrate, and from this time the diarrhœa rapidly ceased. For the past ten days there have been no stools except after the enemata, no more amœbæ have been found, and the patient is regaining his strength ; but the case is too incomplete to permit any conclusion as to the final result.

In chronic dysentery no topical application has proved so efficient in my hands as large enemata of nitrate of silver, one or two grains to the ounce. In this strength they rarely cause much pain. The first effect is sometimes to increase the frequency of the dejections, but this temporary aggravation lasts only one day. Occasionally a very striking improvement is observed from a single enema, but usually the treatment has to be repeated once or twice daily for several days. When not continued longer than this there is practically no danger of argyria, and no necessity for following the silver enema by one of a common salt solution, as recommended by some writers. In acute dysentery it is best to begin with very weak solutions, $\frac{1}{16}$ or $\frac{1}{8}$ grain to the ounce, and then rapidly increase the strength as the bowel becomes tolerant of the drug.

Good results are reported also with enemata of alum 20 grains to the ounce, cupric sulphate 2 to 5 grains, creolin 4 grains, iodoform 2 to 6 grains suspended in starch mucilage, salol 1 grain, and with an eight per cent. solution of peroxide of hydrogen.

As regards the question of danger from large enemata in dysentery, any one who has seen a colon riddled with ulcers, some of them perforating to the peritoneal surface and just on the point of rupture, must admit the possibility of a fatal accident from sudden and forcible distention of the gut. I am not aware, however, that rupture has ever been produced in this way in dysentery, and Dr. Osler is mistaken in quoting me as having reported the case of a child in whom general peritonitis followed such an injection. The only instance that I can recall in which death was caused by a rectal enema was that of an old man with rectal cancer, and probably cancerous or decubitus ulceration above the point of stricture. To relieve an acute attack of constipation his homœopathic physician administered an enema which was rapidly followed by collapse and symptoms of perforative peritonitis. No autopsy was made, but there was no reasonable doubt as to the cause of death. The chances of such an accident in dysentery may be very small, but the mere possibility of it, when ulcerative processes are suspected, should make us careful to introduce enemata with the lowest necessary hydrostatic pressure.

The present popularity of local methods of treatment for dysenteric affections is not, I believe, merely temporary. So far as they are practicable, they are as much indicated in colitis as in inflammations of other accessible mucous membranes, but too much must not be expected from them. In some acute cases they cannot be carried out effectively, while in chronic dysentery the local pathological conditions are often beyond remedy, to say nothing of the hepatic and other remote changes that cannot be reached in this way. But even with these drawbacks the plan is rational, and, when carried out properly as to method and cautiously as to the drugs used, is a most valuable addition to our therapeutic resources in dysenteric diseases.

As the limits assigned to this paper have been already exceeded, I can touch only very briefly on two points in the *dietetic* treatment. From ancient times there has been a very common prejudice, both in our profession and among the laity, against the use of milk in intestinal fluxes, and clinical experience has shown that it is not without some foundation. Although no article of food agrees so generally with these patients as milk, when given perfectly fresh, or peptonized, or diluted with lime-water, or in the form of whey, koomis or matzoon, or in frequently-repeated, small rather than large potions, this diet needs careful watching. Not only may digestion be overtaxed by mere excess in quantity, but one has to bear in mind also a possible idiosyncrasy on the part of the patient, adult or infant, that makes milk intolerable

in any amount or in any form. Such cases, I admit, are rare. Usually the fault is with the form of milk or its method of administration, but this more or less complete intolerance does occur in intestinal fluxes and is often overlooked. The stools should be examined habitually for undigested curds, and when these are present the milk must be reduced in quantity, or given in another form, or abandoned entirely at least for a time.

The other point is the importance of a liberal use of meat in chronic forms of dysentery. Graves[52] in his clinical lectures says, "I have found several cases, which had obstinately resisted the most varied remedies assiduously employed, get well rapidly after a liberal allowance of meat was given; and at present, when called on to treat a case of dysentery of long standing, the first thing I do is to put my patient on full meat diet." I have found this suggestion of much value in my own experience. These patients are always anæmic, and full nutrition is essential. In no way can this indication be met as well as by meat in any easily assimilable form, such as scraped meat, raw or partly cooked, salted and peppered to the taste of the patient; or, when bread can be digested in small quantities, scraped meat sandwiches, with the thinnest possible layers of bread, or even tender cooked meats in the usual forms when the patient can be relied upon to masticate them perfectly.

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THE USE OF GALLIC ACID AND THYMOL IN CHYLURIA.

In the *Indian Medical Gazette* for December, 1891, NUGENT reports the case of a man, aged 22, who was admitted to the hospital suffering from chyluria, the urine containing the *filaria sanguinis hominis*. He was given 15 grains of gallic acid three times a day, and after a few days this was supplemented by 2 grains of thymol thrice daily. The dose of thymol was increased to 4 grains, and finally to five grains, and the gallic acid to 20 grains. The urine now became darker in color and somewhat clearer, and very rapid improvement took place, the urine, in the course of two weeks being free from chyle, and there were now no *filariæ* found in it.

In remarks made upon the treatment by Surgeon Walsh, he draws our attention to the use of thymol in the case, stating that, while the gallic acid is by no means a new remedy, that thymol is new, and, in addition, is very efficacious for the relief of tape-worm.

PILOCARPINE IN DERMATOLOGY.

In the *Birmingham Medical Review* for February, 1892, SIMON, after speaking of the employment by G. Simon in 1879, and Pick in 1880, of pilocarpine in the treatment of diseases of the skin, calls attention to the fact that little notice has been taken of the use of the drug in dermatology in England, excepting in so far as its employment in alopecia areata is concerned. The reporter states that he has employed pilocarpine in some cases of chronic eczema with the happiest results. The only objection to its administration is the sweating which it produces and the nausea which is sometimes present after its administration. It would therefore seem that it is not indicated in ordinary cases, but only in those which have resisted other treatment.

A case is reported of a man suffering from chronic eczema, which had greatly thickened his skin so that it was evident that no hope for improvement could be offered until the thickening was absorbed. For the relief of the thickening, ointments of salicylic acid were tried without result, and these failing, he was given subcutaneous injections of pilocarpine. The dose employed was ⅛ and subsequently ⅙ of a grain twice daily. Aside from the sweating there were no symptoms noted of importance excepting that relief was obtained from the itching. Under the treatment the skin became less indurated, and after having been out of the hospital for two months, he was readmitted for another month, during which the treatment was resumed. Altogether, he had one hundred and ten injections, but never suffered local or general discomfort from them. The author points out that while this treatment was prolonged and tiring to the patience of the physician and patient, it was, nevertheless, the only thing which did the man any good.

Simon goes on to state that in prurigo senilis he has found nothing so useful as the hypodermic injection of pilocarpine, and though the relief is only temporary, the few days' respite is of wonderful advantage. In psoriasis he has never found the remedy of any value, and in subacute eczema has seen the drug do harm.

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Leading Articles.

THE ADVANTAGES OF AN INTERNATIONAL PHARMACOPŒIA.

THE approach of the Pan-American Medical Congress, which will meet in Washington in September, 1893, brings forward the very important question as to whether this great gathering of medical men from all portions of the western hemisphere may not prove the appropriate time in which to plant the seed which may eventually grow into an International Pharmacopœia for the western world.

The advantages of such a Pharmacopœia are, it seems to us, self-evident. At the present time much variation exists in the strength and dose, and in the methods of preparation, of nearly all the drugs which are ordered throughout the civilized world. Not only does this difference exist between the methods used by pharmacists and physicians in various countries, but even in the United States, where, in utter defiance of the rules laid down by the United States Pharmacopœia, physicians prescribe and pharmacists dispense preparations many times stronger, or much weaker, than the preparation known under the same name in the United States Pharmacopœia.

The disadvantages of this are self-evident, since a physician who may have received his education, and had most of his experience in one city, may remove to another city, and poison his patient from an overdose of a drug, or get no results, because the drug, as usually dispensed in the second city, is far weaker than that which he has been accustomed to use. Thus, it is well known that, in the city of New York, Magendie's solution is still largely dispensed under the name of liquor morphinæ sulphatis, and is sixteen times stronger than the liquor of the Pharmacopœia of 1870, which is commonly dispensed in Pennsylvania according to the formula of that Pharmacopœia.

In the same way, in certain portions of Missouri and other Western States, a tincture of gelsemium is largely dispensed, which is nearly twenty times stronger than the tincture of gelsemium employed in the Eastern States; and Norwood's tincture of veratrum viride is largely used in some portions of the country in preference to the tincture of veratrum viride recommended by the Pharmacopœia.

These very serious differences, of which only a few have been mentioned, show the importance from the point of view of safety of having a Pharmacopœia which will unify differences which exist in this country and in other countries of North and South America.

The objections which may be raised against the preparation of an International Pharmacopœia are several. First, the languages of the various countries are so different that it would be practically impossible to publish the work in one language. This may be readily overcome by publishing the book in Spanish and English, or, if necessary, also in French. One of these three languages is used universally in all portions of the western hemisphere. The second objection which may be raised is that the physicians of South America and of Central America frequently employ drugs which are practically unknown in the United States and Canada, and rely largely upon those drugs in the practice of their profession. Instead of this variation in the use of medi-

caments militating against an International Pharmacopœia, it seems to us that these very differences are all the more reason for such a unification of medical practices. The North American medical profession would have brought before it, under the official stamp of the Committee of Revision of the new Pharmacopœia, many drugs, which, doubtless, are of value, and which are now unknown to them, while our South American brethren would have placed before them remedies which have been well tried and relied upon by physicians in whom they could well afford to place their confidence. It may also be urged that many of the drugs used in the various countries, and used very largely by certain practitioners, are not of sufficient therapeutic value to enable a committee formed for the purpose of preparing such a Pharmacopœia to insert them in the work. This objection, however, holds with no more force against an International Pharmacopœia than it holds against the present Pharmacopœia of the United States, or any one of the Pharmacopœias of Europe. Very many drugs largely used by practitioners in the United States never have found, and never will find, official recognition in the Pharmacopœia of this country, and it would be one of the duties of the committee to decide as to what drugs are eligible to what might be called the honor list of medicaments. There are still other advantages which are by no means unworthy of consideration. The unification of medicinal agents throughout the entire western hemisphere would bind together the profession in the Western World far more thoroughly than it is possible to bind them by means of International Congresses. It would enable the physician in Mexico or Brazil to employ methods of treatment which he found highly recommended by eminent physicians in the United States or Canada, and it would enable physicians in North America to follow out the lines of treatment recommended by their brethren in the Southern Continent. At the present day it is practically impossible to utilize any therapeutic hints which we receive from South America, because drugs which we commonly employ are mentioned in their journals under names which are totally unfamiliar to us, or are prescribed in forms which are practically unknown or unobtainable in this country.

The remaining advantage is one which, aside from its purely scientific basis, rests upon the advantages which accrue from reciprocity. In such a Pharmacopœia the physicians of South America would have placed in their hands, in the form in which they could readily employ them, the medicinal products of the drug manufacturers of the United States, and it might be possible for branch houses to be established in various countries, which could manufacture finished products from the crude drugs which were indigenous in those parts, provided there was a sale of that drug in the country in which it was made and in all the other countries of the two Americas.

At first physicians and pharmacists in the various countries might experience some difficulty in becoming acquainted with the official names of the various preparations decided upon by the International Committee on the Pharmacopœia, but this could be readily avoided, or to a great extent modified, by the publication, under the official title, of the name which had previously been in use in each nation, at least in the first or second issue of such a Pharmacopœia.

It is earnestly to be hoped that this Pan-American Congress, which bids fair to do more than has ever been done before in the amalgamation of medicine throughout the western hemisphere, may lead to such improvements in methods of treatment, and in the proper use of medicaments, that it will do much towards raising the plane of medical practice, and by spreading widely the use of valuable drugs, do much to prevent suffering, illness, and the death of the millions upon millions of people who exist in the civilized countries of the New World.

POISONING BY ICHTHYOL.

THE increasing employment of ichthyol in the treatment of various conditions, such as sprains, lymphatic enlargements, and certain diseases of the skin, renders a full acquaintance with its powers as a medicinal and toxic agent necessary on the part of the general practitioner and specialist. It is probable that there are few drugs which, applied externally, can exert so favorable and rapid an effect as ichthyol. Many physicians, who have never employed it, can scarcely be made to believe the rapid changes which take place in diseased tissues under its free and proper employment.

We have already pointed out elsewhere the singularly good results which follow its in-

unction about joints which are inflamed by gout and subacute rheumatism. In association with salicylates, there is certainly no application which gives as great relief to the patient as does ichthyol. That the drug is capable of producing poisonous symptoms seems to be proved by the report of an Italian physician, Dr. Bergerio, who has employed the drug as an intrauterine injection after curetting the uterus. Shortly after the injection the patient complained of a fishy taste in the mouth and of the odor of the ichthyol. The pulse became exceedingly rapid, and symptoms of collapse came on with great rapidity. These symptoms, however, disappeared in about twelve hours. Naturally, Bergerio concluded that this case of intoxication was due to the absorption of the drug from the exposed surface of the uterus, and he reports that his colleague, Peroni, observed, in another case, vomiting, headache, convulsions, and diarrhœa after the employment of ichthyol in a patient who was suffering from prurigo.

THE POISONOUS PROPERTIES OF CARBOLIC ACID.

ALTHOUGH carbolic acid is not known to the laity as a particularly rapidly-acting, fatal poison, it is nevertheless becoming more and more evident that it should be placed among the list of poisons which are capable of causing death within a very short time after their ingestion. While prussic acid, aconite, and opium have been the most common forms of poisons when suicide is contemplated, it is becoming apparent that carbolic acid will soon claim a prominent place in the stock in trade of those who wish to rid themselves of life.

The daily papers continually record instances of accidental or intentional suicide from the swallowing of carbolic acid, and notwithstanding the fact that it nearly always produces an intensely painful death because of its cauterant powers, an increasing number of persons are taking this method of committing suicide.

In the *Chemist and Druggist* for June 11, 1892, there are reported four cases of carbolic acid poisoning as having occurred in England within a week, several of which illustrated the rapidity of its action.

A man aged 28 years, ill and unable to work, was found in the morning lying on the floor in his bedroom in an insensible condition, and very shortly afterwards expired. The amount of carbolic acid which he had taken equalled probably half an ounce.

In another instance, a girl of 18 years drank an unknown quantity of carbolic acid from a jar, from which death speedily resulted.

A third case was that of a woman, who was addicted to alcoholism. Her husband found her lying on a bed in a state of stupor, and thinking she was intoxicated with alcohol did not disturb her. Very shortly, however, he noticed the smell of carbolic acid in the room, and at once had her removed to a hospital, where she died in about twenty minutes.

In the fourth instance, a man was seen to reel and fall down from the bank into a river. He was promptly rescued, and remonstrated with his rescuer for preventing him from committing suicide. No sooner was this done than he immediately expired, and a post-mortem examination showed death to be due to shock from carbolic acid poisoning.

Such cases are so frequent and the freedom with which carbolic acid is used is so general that it would be well for the popular papers to do something towards warning the laity of its dangers.

EPIPHORA AND ITS TREATMENT.

PERHAPS there is no department of eye surgery in which so many disappointments have occurred as that which pertains to diseases of the lachrymal passages, and the relief of the epiphora, which, in the majority of the cases, is the most annoying symptom. After the most classical treatment, the epiphora often persists, both to the discomfort of the patient and the disappointment of the surgeon. We make use of the term "classical treatment," although it is evident that we are not in possession of any one definite procedure or series of procedures through which in each case we may hope for success. The journals are replete with descriptions embodying new ideas of treatment, and surgeons are evidently struggling both for and against the so-called older methods, sometimes condemning those which are supported by a vast experience and a host of authorities, and again suggesting others which range all the way from the simplest manipulations to procedures which are so radical that it is a question whether they are not worse than the fault which they are intended to correct. Inasmuch as a great variety of causes lie at the bottom of the diseases which cause the epiph-

ora, it is evident that no single procedure is applicable to each case, and that the highest type of success will be attained by that method which is based upon a scientific understanding of the lesion which occasions the excessive secretion and overflow of tears.

If the lesions, independently of those which are congenital, pertain to the puncta lachrymalia and canaliculi, it is plain that these must be corrected in order to relieve the epiphora. If there is a change in the natural relation of the lower punctum to the eye against which it is directed backward, on account of the various chronic inflammations of the lid and conjunctiva, or in facial palsy, or by virtue of an abnormal position or enlargement of the caruncle, or, in short, by anything which causes a malposition of the punctum lachrymale, the indications for treatment are plain. So, also, if the canaliculus is occluded by the pressure of a stye, a tumor of the lid, a foreign body, a mass of fungus, a "tear-stone," or because a chronic conjunctivitis or marginal blepharitis has closed the mouth of the lachrymal point, or, in short, if there is stenosis of the punctum lachrymale and obstruction of the canaliculus, the indications for treatment are equally plain, and this series of cases may be dismissed from consideration.

When, however, anomalies of the lachrymal sac, for example, dacryocystitis in its various types, and obstruction of the nasal duct of different pathological significance are present, the exact nature and situation of the disease or obstruction are not always evident, and yet upon an accurate knowledge of these points depends the character of the treatment which should be employed. In recent times there has been a most praiseworthy revolt against the indiscriminate cutting of the canaliculus and passage of probes; in other words, against what may be called a mechanical treatment of this affection. We may refer to the paper of Grandmont, in France, who, believing that micro-organisms exclusively cause disease of the ducts, naturally maintains that probes can do nothing to cure the affection; and to the recent communication of Gould on simple methods of treating dacryocystitis, and the proper appreciation of the physiological action of the punctum lachrymale and its sphincter muscle. There can be no harm in working on the side of conservatism, adopting measures which leave these structures intact, and striving to bring the lining mucous membrane into a healthy condition, without, on the one hand, slitting up the canaliculus or the punctum lachrymale, or, on the other hand, bruising and crushing the mucous membrane by the needless introduction of probes.

If Grandmont's assertions are correct, the micro-organisms must come either from the conjunctiva or from the nasal mucous membrane; hence these two regions should be brought into a healthy condition, and with their returning health we may hope for a cure of the diseased lachrymal passages. Paper upon paper has been written in regard to the relation of the nasal chambers to disease of the lachrymo-nasal duct, and yet, in spite of the universal acceptance of this relationship, a good many weeping eyes exist simply because these chambers have not been explored, or, if they have been examined, the treatment directed to them has been of the most routine and perfunctory character.

So far as nasal anomalies are concerned, practically all of the cases may be gathered into several groups: 1, cases in which the epiphora depends upon swelling of the mucous membrane and not upon a true stricture, the primary origin of the difficulty being a chronic or subacute post-nasal catarrh; 2, cases in which the obstruction depends not upon swelling, not upon stricture, but upon a contraction, which, in its turn, is part of an atrophic process in the intranasal passage; and, finally, 3, cases in which the continuance of the epiphora, in spite of apparent permeability of the lachrymo-nasal duct, depends either upon the pressure of a hypertrophic turbinated body, or similar intranasal obstruction, or upon a barrier which may be of the most trivial character, perhaps only a flap of mucous membrane, existing exactly at the intranasal end of the duct. In any of these cases slitting of the canaliculi and the passage of probes are not very scientific procedures. Medicated fluids may be introduced through the canaliculi and into the sac by Gould's method, or, when this will not suffice, by gently dilating the punctum and the introduction of a fine Anel syringe; but at the same time the intranasal conditions require the applications and the procedures which rhinological experience has given us.

In another class of cases, and it is a very large class, the obstruction depends upon a distinct stricture, often cicatricial in character, which directly and definitely closes the duct,—a stricture which may be situated at any part, but selects by preference the point at which the nasal duct enters into the sac, or the lower end where it passes into the

chamber. Conservative treatment will not avail under these circumstances. Medication, however introduced, cannot dissolve the obstructing bands, and the nasal chambers may be cleared by the most radical operation without relief of the condition. It becomes necessary, in other words, to mutilate physiological structures. We may do it with regret, but at present we know no other means. Two methods are usually employed,—either the ordinary one of slitting the canaliculus and dilating the stricture by the successive passage of probes, or shortening the whole procedure by the introduction of a specially-devised knife and incising the obstructing band. A number of knives have been constructed for this purpose; perhaps the one best known is that used by Stilling. Better than this, however, is the ingenious stricturotome of Dr. Charles Hermon Thomas, of this city, which combines in one instrument the important points of guide, dilator, and cutting blade. Considerable patience is required in the performance of the operation. Perhaps for this reason, and perhaps because the instruments have not always been satisfactory, the method has been much condemned, and, certainly in this country, has not had a great number of followers. It seems rational, however, that a cautiously-employed stricturotome and a careful division of an obstructing band will be followed by less damage to the surrounding tissues than by the passage of probes ever so carefully introduced. Be this as it may, it is fair to assume, and the experience of many able surgeons justifies the assumption, that a definite class of lachrymal troubles exists, which is best treated by incision of the stricture, and that these cases will be found when either the character of the secretion from the lachrymal sac or the failure of conservative methods applied both from the conjunctival and nasal side give evidence that the obstruction is directly in the duct. It is not intended to dismiss probes from the service, which, indeed, may be necessary after the stricturotomy; or which, independently of this operation, in many cases fulfil an acceptable mission, but simply to insist that stricturotomy meets an important indication in numerous examples of obstructive disease of the lachrymal passages.

Epiphora is often symptomatic, not of obstruction of the canaliculus or duct, but of eye-strain. Accommodative or muscular asthenopia may originate an epiphora which is not curable until the cause is removed by proper glasses. In other instances, even where there may be physical reasons in the lachrymo nasal duct for an overflow of tears, the cases are materially improved and the excessive secretion of the lachrymal gland prevented by appropriate correction of anomalies of refraction. This being true, in every case of epiphora it becomes important to investigate the refraction of the eye and the sufficiency of the external ocular muscles. Nowhere has this point been better developed than in the paper of S. D. Risley, recently presented to the American Medical Association in the Section of Ophthalmology.

Finally, we come to those cases of disease of the duct, lachrymal sac, and lachrymal bone which depend upon constitutional causes, for example, syphilis, and in which, in addition to local medication and operative procedure, the employment of internal remedies is essential. It is not within the limits of this note to refer to the treatment of certain types of phlegmonous dacryocystitis, complicated lachrymal abscesses, fistulas of the lachrymal sac, and similar lesions, in which epiphora may be one of the symptoms, but which present evident indications to be met with general surgical measures.

Failure to relieve curable cases of obstructive disease of the lachrymal passages, and the coexisting epiphora in most instances, depends upon the thoughtless adoption of a routine method of treatment and carelessness in investigating the true cause of the difficulty.

INTESTINAL ANASTOMOSIS.

WITHIN the last few years methods of restoring the continuity of the intestinal canal after traumatism, or after wounds necessitated by the extirpation of tumors, or of gangrenous portions of gut, have multiplied more rapidly than successful cases of the application of such methods upon the human.

Following in the track of Senn's brilliant writing upon the methods of invagination and lateral approximation come those of Abbe, who proposed to accomplish anastomosis by means of catgut rings; of Robinson, who accomplished the same object by means of rawhide plates; of Brokaw, who employed segmented rubber rings; of Davis, who used catgut mats and solid catgut plates; of Simonson, who employed chromacized gelatin plates. Later it has been proposed to accomplish approximation by means of vegetable plates, those cut from a raw potato being

given the preference. This last method has, experimentally at least, been shown to be entirely practicable, and possesses the very great advantage that the material from which the plates are cut can nearly always be obtained at short notice, and can be rapidly shaped to fill the indications of each case.

All of these methods, according to Abbe, are open to the objection—though they may accelerate the operation—that they do not efficiently guard against leakage or suppuration, or obstruction of the canal from so considerable a foreign body, while by the method of simple suturing probably all these dangers are lowered to a minimum.

Another point of objection, and one which is, perhaps, of greater importance, is that, by means of the various plates, an opening is established so small that absolutely no allowance is made for subsequent cicatricial contraction. That such contraction does occur has been abundantly shown by post-mortem records. Abbe's dictum is that the opening should be at least four inches in length. In one of his cases, the patient died six months after operation, and post-mortem performed at this time showed that the incision had contracted to half its original size.

Two methods of securing the continuity of the intestinal canal have recently been proposed, both rapid, and neither requiring plates or other artificial aids to accelerate the operation.

Maunsell (*American Journal of the Medical Sciences*, March, 1892) gives an exceedingly ingenious technique for accomplishing invagination. When the operation is completed, with the exception of bringing the divided ends of the bowel together, he first unites these ends by two temporary sutures passed through all the coats,—one placed at the mesenteric attachment, the other directly opposite; the ends of the sutures are left long. In a portion of the larger bowel segment directly opposite to the mesenteric attachment, an inch and a half opening is made, beginning an inch from the divided end of the gut. By passing the ends of the temporary suture through this opening and drawing upon them, the bowel can be invaginated. The invaginated cut ends are drawn through the opening, and ten sutures are then passed through and through, including four thicknesses of bowel wall. By drawing up the portion of these threads which crosses the mucous canal, and cutting at this point, twenty sutures are in place. These are rapidly knotted, the temporary sutures are then cut short, and the invagination is reduced, after which the longitudinal slit in the bowel is closed by a Lembert suture. This operation leaves the knots inside the bowel lumen. Most surgeons would probably prefer to reinforce this single line of sewing by an added row of Lembert sutures.

The best method of lateral anastomosis—and this seems the safest and quickest way of restoring the continuity of the intestinal canal—is that proposed by Abbe and described in the current number of this journal. The points of advantage offered by this method are that no artificial aids are required; that it is fairly rapid; that it provides such a large opening that stenosis, of sufficient grade to become obstructive, will probably not develop; and that it absolutely secures against leakage.

The author states that it requires in its performance about twenty minutes. This may be so in his hands, but the surgeon who attempts to follow his technique for the first time upon the human subject will be grievously disappointed. In fact, the time required for all these methods, with or without artificial apparatus, is greatly underrated. Upon dogs they are readily performed, and give excellent results. Upon the human, in the majority of cases,—certainly in all cases where the operator has not familiarized himself by practice upon dogs or upon the human,—the time required for the performance of an anastomosis, or invagination, or circular enterorrhaphy, will be double, triple, or quadruple that set down in the writings of the day. Abbe's method of lateral anastomosis has the merit of a thorough and successful trial upon the living subject. This alone is a greater recommendation than any amount of laboratory work.

It is probable that none of the artificial appliances now employed for lateral anastomosis or invagination, or end to end approximation, will remain long in use. It is possible that still better methods than have yet been devised will be discovered. A step in this direction has already been taken. It has been held as the foundation fact of intestinal suture, that success depends upon accurate approximation of serous surfaces. All the methods of dealing with intestinal wounds have had for their object the accomplishing of this apposition. Robinson has lately shown that it is possible to obtain firm union by bringing in contact with the peritoneal surface of the gut the inner surface from which has been scraped the glandular layer. Jessett has experimented in the same line. Following a recognition of this fact, we may expect new methods of suturing, possibly safer and quicker

than any we now employ, but for the present it would seem that some method, such as that described by Abbe, would for general application be preferable to any of the various plate methods which have been so enthusiastically lauded for the past few years.

Reports on Therapeutic Progress.

THE GALVANO-CAUTERY TREATMENT OF DIPHTHERIA.

After reviewing the present theories about and generally-accepted remedies for diphtheria, Dr. F. Bloebaum (*Deutsche Medizinal Zeitung*, January 1, 1892) gives a full account of his successful use of galvano-cautery. He thinks it satisfies every requirement in the treatment of this disease, and accomplishes results which far surpass those obtained by any other mode of treatment.

By its use the false membrane with its deadly bacilli is burned off, and does not form again. No bleeding occurs, because of the astringent property of the heat. The fever, in his experience, often began to diminish after three hours, and there was always a normal temperature after twenty-four hours. He thinks that this fact shows, as he used no antipyretic or antithermic remedies, the healing power of the cautery. There could be no reabsorption of septic products after the cauterization. Any swelling of the affected part before or after the operation rapidly diminished. By the irritation in the swollen surface, caused by the cautery, and the prevention of any danger of ichorous pus by the caustic, a new vascularization is brought about, and hastens demarcation. Bloebaum claims that by the use of the cautery all indications are with one stroke made favorable, for the malignant diphtheritic swelling is infallibly transformed into a benign burn; therefore, he believes, the key to the rapid cure of diphtheria is found, and his galvano-cautery treatment deserves to be called a specific for diphtheria.

A list of the percentage of deaths resulting from the use of corrosive sublimate, chloride of iron, chinolin, resorcin, bromine, turpentine, as reported by Lunin, serves to recall the difficulty of finding an antiseptic which will destroy the bacilli without harming the organism.

Bloebaum tabulates forty cases treated by him; of these, only one proved fatal, and this was probably because treated too late, at the urgent request of the parents. This treatment must be used early when there has been only a small portion of the deadly poison given off by the bacilli, and it can only be useful when all the diphtheritic patches can be cauterized and thereby sterilized,—that is to say, when they are all confined to the tonsils, the anterior and posterior walls of the soft palate, the uvula and posterior pharyngeal wall; in short, in those places where diphtheria, as a rule, begins.

His tabulated cases show an unusually rapid cure. The fever declined often in from five to six hours, the casting off of the burnt scab, followed in from five to six days. Resulting illness was very rare, and most rare when the operation was performed early.

Of late he powders the burn, immediately after the operation, with dermatol powder, and continues this once or twice daily, thus securing a more rapid healing. Dermatol is a yellowish, odorless, non-poisonous powder, and is an excellent dry antiseptic. He has also secured a very rapid healing of the burn by painting it immediately after the operation with the aniline dies,—hexamethyl-violet, hexethyl-violet, or methylene blue.

He agrees with Hagedorn in the statement that the galvano-cautery treatment is only to be used when the disease is confined to the tonsils, the soft palate, the uvula, and the posterior pharyngeal wall.

SULPHONAL AND SULPHONAL-POISONING.

In the insane asylum at Aarhus, during the past six months, thirty-five patients—twenty-nine women and six men—were treated with sulphonal, and received a total of 268.87 drachms.

As for its hypnotic action, it was tried with nineteen patients who were suffering with various diseases; the cases were partly new ones, partly of long standing. The doses consisted usually of ½ drachm; less frequently of ¼ drachm. In eight cases the action was constant and satisfactory; in eleven cases it was variable,—now good, again uncertain; however, there was always some action observed.

The form of the illness was about alike in the different individuals, but the action was most prompt in the new cases. Unpleasant accompanying symptoms were observed in five cases; but they were of a slight nature, and disappeared upon discontinuing the remedy.

The sedative action was tried in sixteen patients: here the doses were usually 7½ grains three or four times a day, or one dose daily of 7½ grains, and at night 15 grains. In eight cases the result was excellent, and in the other eight less satisfactory, but even here a regular quieting action was obtained, although sometimes not until after the lapse of several days. In three cases the remedy had to be discontinued on account of symptoms of poisoning.

Dr. Geill believes, from his experience, that sulphonal, in average doses of ½ drachm, is a safe soporific, which often acts where even large doses of chloral have failed; and which has, on the other hand, when given frequently during the day in smaller doses, a sedative action. Appearances of poisoning occurred eight times,—five were of a slight nature, three did not occur until after a long use of sulphonal, and were of a very severe form. Geill thinks these due to the cumulative action of sulphonal. In all cases the initial symptoms of poisoning were observed,—great sleepiness and weariness, with unsteady gait, which was increased in the worst cases to a paralysis of the lower extremities. In one case there were also hyperæsthesia and abnormal sensations. Advancing paralysis, such as others have noted, was not observed in any of these patients.

In all the severe cases the paralysis was put in the background by the disturbances of the digestive apparatus. Here there were lack of appetite, nausea, vomiting, diarrhœa, or constipation, combined with severe and long-continued pains. There were also kidney symptoms, scanty and painful passage of urine, and paralysis of the bladder.

In all cases in which the poisoning symptoms did not quickly vanish, there was a peculiar, abnormal color of the urine. "The urine had a reddish-black color, like port wine, and gave an acid reaction." This peculiar phenomenon disappeared with the other symptoms of poisoning. As to the nature of the appearance he was uncertain, for he could not find either blood or biliary pigment in such urine, and therefore thinks the phenomenon may be caused by some products of the sulphonal which are formed in the body.

Until these decomposition-products found in the urine can be determined, he believes we must hold the hypotheses that the action of the sulphonal upon the central nervous system causes the poisoning, and that the abnormal coloring of the urine is caused by harmless (although in large quantities irritating to the kidneys) products formed in the organism during continued use of sulphonal. —*Wiener Medizinische Blätter*, No. 16, 1892.

EPIDERMIN—A VEHICLE FOR THE ABSORPTION OF VARIOUS MEDICAMENTS.

Dr. S. Kohn (*Med.-Chirurgisches Centralblatt.*, Vienna, April 29, 1892) describes a base prepared by himself, and named epidermin, which, he says, is especially valuable in dermatology. Epidermin is pure beeswax artificially compounded into a liniment with water and glycerin. It is a milky, half-fluid substance, which attains greater consistency upon being exposed to the air. Spread upon the skin, it dries in a few moments to a tenacious, elastic, and delicate pellicle. The glycerin contained in it causes it to retain these conditions. The preparations are kept in glass bottles, with glass stoppers and wide necks. He compares epidermin with other substances in use, showing its advantages, and gives fourteen preparations, in each of which it is the basis.

THE VALUE OF ANÆSTHETICS IN OBSTETRICS.

Dr. A. Dührssen (*Berliner Klinische Wochenschrift*, No. 15, 1892) calls attention to the many cases in which anæsthesia is of service in obstetrics. He fears that while specialists are perfectly accustomed to its use, too many physicians make little or no use of it. Doubtless, in some cases, this is because there is no other physician at hand to administer the anæsthetic. When he has occasion to perform an obstetrical operation, and is alone with the midwife, he himself first prepares the patient for the operation, placing her in the proper position; then he disinfects himself, then the patient, and after this devotes himself entirely to administering the anæsthetic. As soon as the anæsthesia is complete, he brushes off his hands once more with the disinfecting solution, and proceeds to the operation itself.

Obstetrical operations are usually brief, so that one deep anæsthesia is usually enough to allow their completion. When this is not the case, the nurse may be directed, in case the patient awakes, to put one or two drops of chloroform upon a thin cloth mask, which lies over the patient's mouth. When managed in this way, he thinks there is no blame attaching to the physician should a bad result follow.

The severe asphyxia occurs chiefly in the beginning of anæsthesia, later only when unreasonably large quantities of chloroform are applied. A man is protected from these asphyxias, or against the blame for them, when he devotes himself at first exclusively to administering the anæsthetic, and becomes, to a certain degree, simply the chloroformer.

Anæsthesia is very valuable for the patient, since it spares her pain. If she is suffering very much and tossing about, it may be impossible for the physician to make a complete diagnosis without producing anæsthesia. He then can ascertain if the infantile pulse is normal. The mother's pulse while narcosis lasts is also important; if it remains above 100, it is a sign something is wrong.

The internal examinations are vastly easier to make, and thus the physician is promptly able to make choice of the most suitable obstetrical operation. If it is a sensitive, first confinement, it may, on account of the tense perineum, be difficult to reach high enough into the pelvis to ascertain how far the head has advanced into the pelvis. If, in such a case, there also exists a considerable swelling of the head, which may reach clear down to the vulva, the physician is easily led to believe that the head is already well down in the pelvis, and that an extraction with forceps will be easily possible. In fact, the head may still be above the entrance to the pelvis, and the use of the forceps would be difficult or impossible; in such a case turning might be possible later. When an anæsthetic is used, such errors are prevented, for the pelvis can then be thoroughly explored.

It is also very important to produce anæsthesia, in order to make correct diagnosis of abnormal presentations; especially is this the case when there is a posterior parietal presentation, or a deep transverse presentation; and it is valuable in all cases where the part presented is still high and we cannot make an exact diagnosis with one or two fingers, but need to introduce the whole hand.

The same is also true of the cases where some malformation, abnormally large head, etc., are met; also where no part is presented, or the presenting part is still high above the pelvis.

In the second place, anæsthesia is of valuable assistance in obstetrics in all those cases where turning needs to be assisted by the outer hand. Among these cases belong turning, and especially the combined turning of the child, the loosening of the placenta, and the presence of tumors; and also when the os uteri is insufficiently dilated.

In the third place, anæsthesia has a very great value as a direct therapeutic agent, and that, too, used very superficially, in hastening the delivery, as in cases where the pains, although very great, do not accomplish much, and where the uterus does not relax properly in the pauses.

The production of anæsthesia is contraindicated in cases of sepsis, or should at most be very cautiously undertaken, for so-called chloroform death has been seen in cases of sepsis. Chloroform death may follow an abortion at the very first breath of chloroform.

Deep and long-continued anæsthesia is contraindicated in cases of eclampsia. The narcosis is very valuable in eclampsia, but only in order to permit an obstetrical operation; the earlier this is performed the better, as eclampsia affects the heart-muscle.

Narcosis is contraindicated in cases of tetanus uteri, and where there is weakness of the heart.

THERAPEUTICS OF SYCOSIS.

The very good results which he has obtained in his treatment of sycosis, have led Dr. Ernst Kromayer (*Therapeutische Monatshefte*, April, 1892) to make public his method. He assumes that every sycosis is caused by micro-organisms: the so-called parasitic sycosis by the fungus of herpes tonsurans (trichophyton), and simple sycosis by staphylococci.

The infection of the skin does not occur once only, but is constantly repeated by the contact of surrounding hairs with the sycosis vesicles; further, it is confined to the epidermis. The two points important for the treatment of sycosis are, according to Kromayer,—

1. Every sycosis is parasitic.
2. Every sycosis spreads by the infection of the epidermis.

From these follow the treatment, which is alike for both kinds of sycosis,—

1. The prevention of the infection of the epidermis, thereby preventing the spreading and recurrence of the sycosis.
2. To heal the places already infected.

The first thought is to destroy the micro-organisms by means of antiseptics. Unfortunately, we are unable to destroy the fungus when it has entered the tissue, even such a superficial tissue as the epidermis, much less when its seat is in the deep hair-follicles of the beard.

As the sycosis is an inflammation, it must be quieted and the affected tissue relaxed. The first can be done by a good salve, and the second by the removal of the diseased hairs by

depilation. The salve should be of a pasty consistency. What its ingredients are is of less importance. Kromayer usually makes use of the following:

Acidi tannici, ʒss;
Sulphuris præcipitati, ʒi;
Zinci oxidi,
Amyli, aa ʒi¾;
Vaselini, ʒv. M.

In very severe cases more heroic measures must be used,—incision, puncturing, scarification, sharp spoons, and, not last, Priesnitz bandages.

In some cases an opening of the pustule and subsequent cauterization with a concentrated caustic potash solution acts excellently.

The spread of the disease is prevented with great certainty when not only the diseased but the healthy hairs are pulled out.

In order to kill any of the micro-organisms which may lie upon the scalp, before they enter the follicles, a thorough disinfection must take place. The natural oil of the scalp makes this difficult, but it can be accomplished by the use of the following solution:

Hydrarg. bichlor., gr. xv;
Alcoholis, fʒiii. M.

The whole scalp should be thoroughly soaked with this night and morning, and this course not given up until some time after apparent healing, and thoroughly washed afterwards. In the evening the depilation should be followed by the use of the sublimate solution; then a dressing with the salve. In the morning, after a thorough cleansing, disinfection should again be followed by the use of the salve, unless the patient's occupation prevents. Kromayer has treated thirty cases of sycosis, all resulting in rapid cure. Some of these cases were of long standing.

THERAPEUTICS OF DIPHTHERIA.

Dr. Stein (*Therapeutische Monatshefte*, April, 1892) draws a doleful picture of his treatment of diphtheria among the very poor. He had a mortality of seventy per cent. In 1890 an article praising Dr. Josef Burghardt's mode of treatment caused him to try it, with excellent results.

He prescribed a gargle three times daily of equal parts of lime-water and distilled water, then the most nourishing food, then another gargle, then a powdering of the diseased portions of the throat with Burghardt's blower, with a mixture of equal portions of washed sulphur and quinine. There was no great effort to avoid reaching also the unaffected parts. Then no food or drink could be taken for an hour and a half. In rhinitis, the powder was also blown into the nose, remembering Dr. Titta's caution not to cease the pressure upon the bulb until it was withdrawn from mouth or nose. Stein treated nine cases in this way, and lost only one, a child, whose treatment had to be left in part to incompetent persons, who did not obey orders. Of thirty-three cases reported by Burghardt himself, all recovered; and Titta lost two out of twenty-seven cases. The treatment is convenient for both physician and patient; only one of Stein's patients made the least objection to the powdering. It appears to shorten the duration of the disease, the necrotic portions being more rapidly thrown off, and the diphtheritic process being hindered in its progress.

THE TREATMENT OF PNEUMONIA WITH DIGITALIS.

Rudolf Haepfel (*Therapeutische Monatshefte*, April, 1892) reports fifteen cases of pneumonia which he treated with digitalis. He used the following infusion:

℞ Infus. fol. digitalis, gtt. xlv to ʒi to fʒiii;
Aq. dest.,
Syr. simpl., aa fʒv. M.
Sig.—One tablespoonful hourly.

The mixture would, therefore, be used in about twelve to fifteen hours. Of course he did not confine himself to ordering this dose, but had ice-bags applied, and enveloped the whole body in wet sheets. In a few cases he had recourse to leeching, and once, in a case of threatening œdema of the lungs, to venesection.

However, except in a single case, he made no use of antipyretics, such as antipyrin and quinine. Especially for old persons, he prescribed strong wine from the beginning. The reports of these cases go to show that there was no toxic action of digitalis, for in one case the vomiting was prevented by the addition of strong coffee. In two cases vomiting occurred after the first three or four doses, when no toxic action was yet possible.

He considers the vomiting rather as an idiosyncrasy against digitalis, and has had it occur when administering a very weak solution.

In from one to two days, in many cases after two doses of the digitalis, the temperature diminished, the symptoms of pneumonia, difficulty of breathing, stabbing pain, etc., grew

less marked, and in three cases they ceased entirely.

All the cases treated with digitalis showed a decrease of two or three days in the duration of the disease.

It is remarkable that eight cases terminated by lysis.

He thinks the digitalis does not have any direct antipyretic action, for he gave it in two cases of acute rheumatism, and observed no decrease in the fever. He thinks there is an indirect antipyretic action, following the stimulated activity of the heart.

THE THERAPEUTIC USE OF HYPNOTISM IN INSANE ASYLUMS.

PROFESSOR BINSWANGER (*Therapeutische Monatshefte*, March and April, 1892) reviews the whole literature of the use of hypnotism in treating the insane. Many of the reported cases he finds are open to criticism; in some the diagnosis was evidently not correct or exact, and in others the reported cures were of too short duration to be of great value. But even if all that its most enthusiastic supporters claim for hypnotism in this field is true, the total results are small, indeed, for the time and effort put forth. The patients benefited were almost, if not exclusively, victims of hysteria. Occasionally the efforts to hypnotize have produced convulsions and other active symptoms. This fact has led Binswanger to urge that hypnotism should always be used most carefully, as a dangerous remedy, whose precise action cannot be predicted. He has also found that long-continued use of hypnotism renders the patient feebler in intellectual force,—mentally weary. One patient would often fall into lethargic sleep in the daytime, and also have attacks of spontaneous hypnotic sleep. The skilful use of hypnotic suggestion had a marked success in a number of cases of melancholia, chronic alcoholism, and all the varied forms of hysteria. They constitute the whole range of its usefulness so far.

Binswanger wishes there might be many experiments in the German institutions to pursue these investigations with clear, unbiased minds, without prejudice, and equally without misjudged enthusiasm.

THE INFLUENCE OF CEREBRAL ACTIVITY ON THE ASSIMILATION OF PHOSPHORUS.

In an exceedingly interesting paper, ALEXANDER CHTCHEBRAK (*Thèsis*, St. Petersburg, 1890; *La Tribune Médicale*, April 28, 1892) has studied the above subject. Three series of experiments were undertaken by the author: First, in regard to the influence exercised by healthy brains; second, regarding the influence exercised by slow or comparatively non-active brains, such as those of idiots and imbeciles; and, third, about that exercised by brains of animals under the action of morphine. As a result of these experiments, he, in general, found that excessive cerebral action—that is, intellectual overwork—produces, other things being equal, an increase in phosphorus waste; that these effects are not observed as the result of physical overwork, nor as that of a moderate mental activity; and that in microcephalous subjects the quantity of phosphorus assimilated is quite small, fixed, and is not modified by the amount introduced with the food. In healthy man the quantity of phosphorus assimilated is larger by far than in microcephalous individuals, and it varies daily in quite appreciable proportions.

For the purpose of ascertaining the part taken by the cerebral substance in the assimilation of phosphorus, the author instituted another series of experiments, in which he not only studied the action of morphine on the cerebral circulation, but also the amount of phosphorus, which, under such conditions, would be found in the arterial blood and in the blood traversing the brain.

The investigator observed that the first action of the drug in question was to increase the rapidity of the cerebral circulation, followed by a diminution. This diminution lasted from one to two hours after large doses; with small quantities the circulation soon returned to normal. The increase in the rapidity of the circulation, which was accompanied by a rise of the arterial pressure, is due to an increased action of the heart brought about by paralysis of the cardio-inhibitory apparatus, there being also a reflux of venous blood. The diminution of the arterial pressure and the venous reflux (a cerebral ischæmia), occurring in from thirty to forty seconds after a subcutaneous or intravenous injection of morphine, is due partly to weakness of the heart, partly to contraction of the cerebral vessels.

The examination for the phosphorus of the arterial blood was made in the blood of the carotid artery; for that of the venous, in the external jugular. In normal conditions the phosphorus found in venous is less than that found in arterial blood, the difference varying from .08 to .09 per 1000. In natural sleep the proportion is .110 per 1000; in

narcotic sleep, .086 per 1000,—a marked difference.

The author affirms, from the foregoing, that in man the assimilation of phosphorus is subject to modifications, it being increased in relation to cerebral activity; that in microcephalic, idiotic individuals the quantity of phosphorus required is less than in normal persons; but is, on the other hand, more stable and more constant; and, finally, formulates the following general conclusions: 1. The modifications in the assimilation of phosphorus can only occur in the two extreme conditions; on the one hand, under the influence exercised by increased, continuous intellectual work, and, on the other, the lessened mental activity of idiotic brains. 2. Moderate intellectual work, or a feeble work, as in the case of weak, imbecile brains, does not modify the assimilation of phosphorus.

THE TREATMENT OF PLEURISY.

In a discussion held on the paper read by Dieulafoy before the Academy (*Bull. de l'Académie de Médecine*, April 26, 1892), ALPH. GUERIN said that inflammation of the serous membranes could be defined as "an exaggerated invasion by the elements of the blood of the lymphatic territory." The continuity of the arterial with the lymphatic system permits us to observe upon the pleura a phenomenon similar in every respect to a pleuritic effusion; that a lymphangeitis or a plethora of the lymphatic vessels interferes with the capillary circulation, giving rise to sanguineous and fibroserous exudations. If acute pleurisy were treated by bloodletting, blisters, etc., according to the method of Laennec and his followers, there would be scarcely any occasion for the practice of thoracocentesis; and that, finally, the frequent occurrence of empyema was not due to the piercing of the pleura, but to the lack of employing at the beginning of the pleurisy an active and rational therapeutic course.

Peter said that an effusion may be interfered with or prevented; that a moderate exudation (from 500 to 1000 grammes, for example) is a condition that calls for revulsion, and that thus the piercing of the thorax might be avoided, especially if the disease has not yet reached the twentieth day; that if the exudation is considerable (say from 1800 to 2000 grammes), thoracocentesis should be practised after the twentieth day, and better by aspiration. The speaker, therefore, agreed in all points with Dieulafoy.

Germain Sée condemned blistering.

SULPHORICINATED PHENOL IN THE TREATMENT OF DIPHTHERITIC ANGINA.

A. JOSIAS (*La Médecine Moderne*, April 28, 1892) has obtained the most excellent results in the treatment of diphtheritic angina by means of sulphoricinated phenol. This substance is composed of twenty grammes of phenic acid and eighty of sulphoricinate of sodium. The new medicament is locally applied to the false membranes by means of a tampon that has been immersed in a solution of the strength of twenty per cent. The applications are made as often as five or six times in the twenty-four hours,—four times during the day and one or two at night. At the same time, painting or sponging over with alkaline, non-irritating solutions, such as lime-water, should be practised, in order to soften and facilitate the detachment of the false membranes. For general treatment, a tonic medication and good alimentation is of great importance. The method just described has never been followed by untoward effects. After a cure has been produced, the author recommends, chiefly for the purpose of preventing a relapse, painting the parts affected three or four times in the twenty-four hours with a mixture of salicylic acid and glycerin, and mouth-washing with a three per cent. solution of boric acid.

According to the statistics collected by the author at the Hôpital des Enfants, of thirty-two cases treated by the new method, twenty-four resulted in cures, thus giving an encouraging average of success of seventy-five per cent. The author believes, therefore, that, except in rarely toxic cases, diphtheritic patients will recover if treated at the beginning of the disease, especially by the method advocated, which, as a whole, constitutes an energetic but successful treatment of diphtheritic angina.

THE ELECTRICAL TREATMENT OF FIBROMYOMA OF THE UTERUS.

BROSE (*Zeitschrift für Geburtshülfe und Gynäkologie*, xxiii. Band., 1892) recommends, first, the use of a galvanometer, when one holds that as much electricity must be given as the patient can comfortably endure. The aluminium sound should not be used as the active pole, since it is acted upon by acids and the outer layers of the metal disintegrate. Either platinum or carbon should be employed.

The indications for the use of electricity are,—

1. All tumors where bleeding is the promi-

nent symptom. These cases are to be treated by the intrauterine application of the positive pole.

2. In tumors which from their size produce pressure symptoms, and are accompanied by dysmenorrhœa, etc. These cases are to be treated with the negative pole.

MacKenrodt thinks the use of electricity in these conditions, when applied by unskilled hands, is both uncertain and very dangerous, because of the danger incident to the frequent uterine manipulation, and to the fact that, after each sitting, there is left a necrotic mass, which may readily become infected with septic organisms.

Schaeffer says the previous disinfection of the vagina and cervix, before passing the electrode into the uterine cavity, is both superfluous and dangerous. Only the sound should be rendered antiseptic. The galvano-puncture is only to be employed in those cases where it is impossible to introduce the electrode into the uterine cavity.

In the thirty-five cases examined, interstitial fibromata were found. Of these, twenty-six were treated by the intrauterine anode. Twenty-five of these had electricity during the bleeding. In one case the pressure symptoms were relieved without any apparent change in the tumor itself.

Of the twenty-five cases treated during bleeding, two were not improved. Twenty-one of these cases remained under observation, and these, after three years, still were free from bleeding. The number of sittings required to stop the bleeding was from seven to forty-six. In four cases bleeding returned, but by again using the electricity it disappeared a second time. Only in two cases were positive change in the tumor observed.

Schaeffer found that in only one case of the forty he treated did the tumor entirely disappear. The longer the uterine cavity the more unfavorable the prognosis as regards relief from hemorrhage. The duration of the use of electricity varies from six to eight weeks to as many months. The bleeding in some cases is first increased, and this condition may last some weeks before any relief is noticed.

In the majority of cases, one hundred and fifty milliampères were used, but in some cases two hundred and fifty were employed. The application is especially painful in those where the uterine mucous membrane is sensitive to the introduction of the sound. The theory as to how electricity benefits these cases is as follows:

The application of the positive pole produces scar tissue-changes in the uterine mucous membrane, thus checking the bleeding. The action of the cathode is not so intense, but this is decidedly more dangerous than the anode, as it causes considerable congestion of the pelvic organs. In three cases this was so marked that periuterine inflammation around the tumor was the result. There is in the cavity of the uterus, as a result of introducing the electrode, a formation of gas, which not only acts on the mucous membrane, but also works its way into the submucous tissue. It causes coagulation in the lymph-channels and blood-vessels, thereby diminishing the vitality of the tissue. The effect is also produced by the influence on the trophic nerves.

THE USE OF HYDRASTININE IN UTERINE HEMORRHAGE.

CZEMPIN (*Annales de Gynècologie et d'Obstetrique*, March, 1892) has used this drug during the past nine months in forty-seven cases. He finds that it should not be used where the hemorrhage depends upon more or less phlegmasia of the uterine adnexa. In three cases, hemorrhage that had previously been copious, ceased in from twenty-four to thirty-six hours. In three other cases, the hemorrhage stopped, returned again, but finally ceased altogether in four or five days. The drug is very valuable in the early hemorrhages following uterine subinvolution.

Of the twenty cases of chronic endometritis with bleeding, in thirteen the results were especially good, six were benefited, and one case was not improved. In two cases of postpartum hemorrhage, the results were very good. In one case, in which excessive bleeding occurred at the first menstrual period after an abortion, the result was bad; ergotin was used here with success. Of the total forty-seven cases, in twenty-six the results were satisfactory; nine cases were benefited; eleven were not improved.

Basing his opinion upon this trial of hydrastinine, Czempin states that the action of the drug is not constant. It does good by its properties as a vaso-motor constrictor, acting especially upon the small vessels of the mucous membranes.

It may be judiciously combined with either ergot or ergotin in certain cases. It is especially useful in acting upon the muscular tissue of the uterus after puerperal subinvolution, and in those cases of bleeding, the result of atony of the uterus after birth. It also acts well in congestive and chronic catarrhal conditions of

the mucous membrane. Falk arrived at the same conclusions as Czempin.

CHLORIDE OF ETHYL AND PENTAL.

Drs. H. C. Wood and David Cerna have made an incomplete study of these two drugs. Chloride of ethyl is at present largely used as a local anæsthetic agent, which acts not by virtue of any inherent anæsthetic properties, but on account of the intense cold produced by its extraordinary rapid volatilization. The extreme volatility of the chloride almost proves, *a priori*, that any effect which it may have upon the human system will be of correspondingly brief duration, since very volatile substances are thrown off from the lungs with rapidity. This *a priori* reasoning is entirely confirmed by their direct experiments.

Wood and Cerna have found it difficult, without the construction of special inhalers for the use of large quantities of chloride, to produce anæsthesia in the dog by the ordinary method of administration. The chloride disappears from an inhaler which allows free access of air, almost as fast as it can be poured on. They used it in two ways. In the one way they connected a large rubber tube with a canula, placed in the trachea of the dog, and then squirted the anæsthetic into the tube in such a way that it would diffuse itself over the walls of the tube for a considerable distance. The administration in this way of ten grammes of the chloride of ethyl failed to produce distinct anæsthesia in the dog, although the respiration was affected and some fall of the arterial pressure occurred. They give details of two experiments.

Experiment I.—Dog weighed twelve kilos. Given ten grammes by inhalation, thrown into the tracheal tube in about three minutes. During this time the circulation varied at different periods considerably. No anæsthesia was produced. The arterial pressure was at first reduced.

Experiment II.—Dog. Normal pressure 190 millimetres; pulse-rate 120. Ten grammes chloride of ethyl introduced into tracheal tubes as rapidly as possible. After an inhalation of twenty seconds, pressure 185, pulse-rate 144. Seventeen seconds later the pulse began to grow slow and the pressure to fall. Eleven seconds later, mean pressure 155, pulse-rate 72, the individual waves varying from one to two centimetres in height. This condition with gradual rise of pressure continued for a minute, when the pressure rose to 190 and the pulse-rate to 140. No anæsthesia was produced.

Besides employing the ethyl chloride in the way just described, they made one experiment in which a cone, almost impervious to the air and so flexible that it could be tightened around the dog's nose, had placed in it ten grammes of the liquid and then tightly applied. The results of this experiment are given in the table below.

Experiment III.—Dog, Weight 16 Kilos.

Time. Min. Sec.	Pressure. Mm.	Pulse per Min.	Respiration per Min.	Remarks.
0.	160	150	66	
0.20	168	150	60	*Inhalation* of contents of one tube (10 grammes of drug) put in a very close receptacle and this placed over the nose.
0.50	150	81	18	
1.20	120	105	60	Anæsthesia.
3.20	160	168	90	Reflexes return.
6.20	160	144	150	Inhalation of contents of second tube.
7.20	150	150	33	No anæsthesia.
8.10	160	150	51	Inhalation of contents of third tube.
8.40	150	144	24	Reflexes lost.
9.10	90	105	36	Animal eventually killed.

This experiment shows that the chloride of ethyl is capable of acting as an anæsthetic, provided that its vapor be given in concentrated form. Why anæsthesia was not produced by the second inhalation of ten grammes is not clear, but we believe that it was because air was taken in more freely, owing to the cone not having been placed tightly over the nose of the animal. The results of this experiment indicate, first, that the effect of the drug is exceedingly fugacious, since ten grammes failed to produce a complete anæsthesia of more than two minutes' duration, this, further, in spite of the fact that air was not furnished with sufficient freedom to yield the full supply of oxygen to the blood; secondly, that the anæsthesia is accompanied with a marked fall in the rate of the pulse and the force of the arterial pressure, the pressure having fallen forty-eight millimetres and the pulse 45 per minute at the coming on of the first anæsthesia, while in the third inhalation, shortly after the loss of the reflexes, the pressure stood at 90 instead of the norm, 160.

Owing to the comparatively small amount of the chloride of ethyl at their disposal,

in the further study of the chloride of ethyl they confined themselves to administering the drug by injecting it into the jugular vein. This method of experimentation has the advantage of greater exactness in dosage, and the results are entirely parallel with those which follow the administration of the remedy through the lungs.

It is plain that, whether a drug be injected directly into the jugular vein or whether it enter the system by absorption into the pulmonic capillaries, it must first reach the heart before being diffused throughout the general circulation. In the one case the drug passes first into the right side of the heart, while in the other case it goes into the left side of the heart. The anæsthesia which follows the injection of the chloride of ethyl into the jugular vein is very fugacious, and only a very small amount of the drug will nevertheless reduce the circulation to a very dangerous degree.

The effect of chloride of ethyl upon the respiration is very marked. If the dose has been sufficient to produce anæsthesia, the respiration at first is often stimulated, in the extent of the movements as well as in the number per minute. Thus, in one experiment, the normal respiration being 50, the rate became 60 ; in another, the rate increased from 70 to 80, without, however, any increase in the extent of the movements ; a little later in this experiment, the animal still being anæsthetic, the number of the respirations fell to 40 per minute, but became nearly quadrupled in size. In still another experiment the respiration before the injection was 60 per minute, and after the injection, during the early anæsthesia, was still 60 per minute, but the excursions of the needle connected with the Marey's tambour were three times the size of what they had been before the administration of the drug. In a fourth experiment the respirations before anæsthesia were 70 per minute ; during the early anæsthesia 120 per minute ; a few seconds later 100 per minute ; the movements of the needle being at the same time enormously increased.

In all their cases the fall of blood-pressure, after the injection of chloride of ethyl, was immediate and excessive; the blood-pressure continued low without rise during the whole period of anæsthesia, but returned rapidly to the normal as anæsthesia wore off. The cardiac beats were always at first arrested, but subsequently became of enormous size and continued so almost to the end. The pulse-waves were also at this time absolutely consonant with and proportionate to the respiratory movements.

Wood and Cerna believe that their research has demonstrated, first, that the chloride of ethyl is capable of acting as an anæsthetic, but that it is eliminated with extraordinary rapidity and that its action is extremely fugacious ; secondly, that the anæsthesia which it produces is always accompanied by a fall of the blood-pressure, which is probably at least in part due to direct depressing effect of the drug upon the heart ; thirdly, that the action of the drug upon the circulation is in no way dependent upon its influence upon respiration, although it is not certain that the pronounced depression of the blood-pressure is not a factor in influencing respiratory movement ; fourthly, that, at least in the dog, chloride of ethyl produces at first an increase of the respiratory movement either in rate or amount, or more commonly in each respect, but that finally respiration becomes slow, and at last stops almost abruptly ; fifthly, that usually, if not always, the cessation of heart-beat and the arrest of respiratory movement occur as nearly simultaneously as may be.

As the result of the various experiments which they have made with chloride of ethyl, they believe that the fugaciousness of the action of the drug must interfere with its use as a general anæsthetic, and that its depressing effect upon the circulation is too pronounced for it to be a safe anæsthetic. It is most probable that if it should come to be employed in practical medicine as an anæsthetic, there would be a record of sudden deaths through cardiac failure proportionately even more numerous than those caused by chloroform. On the other hand, their research indicates very strongly that the small amount of chloride of ethyl which is used in producing local anæsthesia for dental purposes has practically no effect upon the human system, any of the drug that is absorbed into the system being eliminated in the course of a few minutes.

PENTAL.

With pental these observers made a few experiments, both by inhalation and injection into the veins. Though the number of these experiments is not great, they seem to show that pental as an anæsthetic acts quickly and fugaciously, but that it will probably be found more dangerous than the chloride of ethyl, and much more dangerous than chloroform.

Each time anæsthesia was produced by pental there was a marked fall of the arterial pressure. Thus, in the first inhalation, the

pressure had fallen from 154 to 100 millimetres, when anæsthesia was complete; while during the second anæsthesia the pressure fell from 160 to 90. In each anæsthetization the respiratory rate was increased, although the extent of the respiratory movements most of the time were not distinctly above the normal.

In no case was death caused by the inhalation of pental.

In one experiment Wood and Cerna showed that the heart was at once affected much more severely than the respiratory centres; that it failed to recover itself, and stopped beating before the arrest of respiration; indeed, full, deep inspiration occurred a half-minute after complete arrest of the circulation.

In conclusion, they are led by their experiments to believe that pental will probably prove to be a dangerous anæsthetic, and if extensively used will produce death by cardiac arrest. It is probable, also, that the after-effects of pental, in the human being, would be disagreeable; at least they repeatedly noticed in the dog a peculiar wild excitement directly after the anæsthesia from pental had passed off.

METHOD OF RESUSCITATION FROM CARDIAC DEATH CAUSED BY THE INHALATION OF CHLOROFORM.

Dr. Maas (*Berliner Klinische Wochenschrift*, March 21, 1892) reports two cases of deep syncope recently treated in the clinic at Göttingen. Formerly, he says, both would have been hopeless, but success was attained at last by the use of a modification of Professor Kõnig's method. This experience warrants the assumption that, after a long stand-still, there has now been an advance made in the manner of resuscitation, which will greatly diminish the dangers of chloroform narcosis.

The first patient was 9½ years old, who was admitted for treatment of harelip. One operation was successfully performed. He was perfectly healthy. After the first wound had healed entirely, the second operation was undertaken. After having been chloroformed, during the manipulation of his mouth he was wakened. Upon this more chloroform was placed on the mask two or three times, so that a fourth of the thin mask was moistened with it. Suddenly his pupils became dilated, the face grew dark-blue, and breathing ceased. Immediately the mouth was opened, tongue drawn forward, and the epiglottis raised. Now there was a very superficial breathing, though no radial pulse could be felt. Without giving further attention to the carotid pulse and heart-beat, the region of the heart was compressed with the frequency of respiration, about thirty to forty times a minute. The air had perfectly free entrance, the cyanosis vanished quickly, the pupils became very narrow, but still no radial or carotid pulse was felt, although the apex-beat could be seen and felt. If the pressure upon the breast was interrupted, the patient breathed almost normally, but the pupils soon dilated again, and gradually the breathing ceased and the face became blue. Pressure upon the heart always contracted the pupils again, and produced after some time a slight reddening of lips and cheeks; only the pulse was still lacking. Gradually the breathing in the pauses assumed the Cheyne-Stokes type, and the heart-action, which could still be felt at first, was no longer perceptible. Still the efforts had the same result upon the pupils and the color of the face. Whether there was a swelling of the pulse in the carotids during the pumping could not be certainly ascertained, because the patient's whole body was moved.

As it finally became difficult to keep the air-passages free, tracheotomy had to be performed; almost no blood flowed as this was done. The case remained, in spite of the streaming in and out of the air, just as fruitless as was the low position of the head and the injection of ether.

At the end of half an hour the condition was much worse; the pupils no longer contracted fully, the medulla was visibly losing its power, and only a few superficial, snapping breaths followed in the pauses. The presence of any heart reaction was not possible. According to all previous experience, the patient would have been considered lost, and put aside to make room for another operation.

Maas worked on in the same manner for three or four minutes, then he thought the course of the air was less extended, and considered a trial of the Silvester method in place. The patient had now every appearance of being dead, but the compression at the region of the heart was renewed in a more rapid time, the pupils again contracted somewhat, and a few sharp breaths came.

The rapid compressions were continued with a few short pauses for another half hour, and the breathing seemed to become more spontaneous in the intervals, more ener-

getic and numerous. There was gradually a perceptible flexion in all the joints of the upper extremities, accompanied by a raising of the shoulders and a wider opening of the mouth. Heart-action was still not perceptible. After about fifty minutes from the beginning of the syncope there were peculiar movements in the heart region, which were supposed to be spasms of the intercostal muscles, because absolutely no sound could be heard from the heart.

At the end of an hour, Maas thought he felt a vibrating motion in the carotids. Continuing the efforts at resuscitation, the lips and cheeks grew red. On interrupting the work the patient breathed quietly, and a quick, little pulse could be felt in the carotid. However, the pupils dilated at once again, though not to the utmost, and twice the breathing grew worse, so that some compressions were still made, which were, perhaps not necessary. No threatening symptoms occurred again.

The very much chilled patient was put in bed with warm water bottles. The face was well colored, and the radial pulse did not appear until an hour and a half or two hours later; the pupils continued dilated all the afternoon, but reacted with the light. The boy slept until morning, and could only be roused by sharp slaps on the face. He made no replies. His complete recovery was very slow. At first he could only digest fluids. For from eight to ten days he was very stupid, then returned gradually to the possession of his former meagre intelligence.

The second patient was a pale, delicate, miserable boy, 13 years old. Nothing special was noted as to his lungs and heart. He was operated on for an abscess of the hip. During the operation, on pulling the boy's leg, he cried out and gesticulated. The third of the chloroform mask was moistened two or three times. Suddenly the pupils became dilated, breathing ceased, the face became blue, and the radial pulse imperceptible. He was worked with for half an hour, as the other patient had been, with the same results. As the compressions were increased from thirty to forty to one hundred and twenty or more in a minute, for ten minutes no result appeared, but after fifteen minutes more a slight carotid pulse-wave, made by contraction of the neck-muscles, was noted during the compression. Gradually encouraging signs grew more marked, until the fingers and arms were moved, the shoulders raised, and the mouth was opened exactly as in the other case; now the breathing increased in depth, regularity, and frequency, and a few compressions sufficed to contract the pupils.

At the end of an hour and ten minutes color came in the pale lips, and a pulse could be felt. The patient was put to bed, and could be left to himself.

During the first half-hour the patient was a good while in an inverted position, then during the rest of the time in a horizontal position. His legs were bound with rubber bandages the last half-hour, but none of these measures appeared to have any effect. For four days the patient lay absolutely apathetic, pulse weak, head rolling back, without stiffness of the joints, mouth open, tongue dry. He cried out often, night and day, spontaneously or upon being touched. The second day he had fever, and pneumonia was feared. On the fifth day he was quieter, and, when asked, told his name in a stammering, scarcely intelligible way. After ten days he could gradually take solid food. The loss of speech improved very slowly. Not until four weeks had passed could he speak about normally.

The following month, when the patient was fairly recovered, the operation was again undertaken, this time with no bad result. The operation lasted from ten to fifteen minutes. The patient was quiet under but a few drops of chloroform, and was not deeply narcotized, having eyelid movement all the time.

TREATMENT OF GASTRIC ULCER.

In an interesting paper upon this subject, DRESCHFELD, of Manchester, England, gives the following directions in the *Manchester Medical Chronicle* for May, 1892, on the prescribing of digitalin:

In those cases in which the most prominent symptoms are localized, epigastric pain, vomiting, loss of appetite, and anæmia, and which principally occur among young and chlorotic females, rest, strict diet, and the administration of alkalies and bismuth has been the stereotyped treatment. It is essential that each of these measures should be, wherever it is possible, strictly enforced. Complete rest in bed for some weeks, recommended at first by English physicians, and more recently insisted upon by Leube, Ziemssen, Ewald, and Rosenheim, is an essential point in the treatment, and must be insisted upon even if there is no hæmatemesis or vomiting of food. After a few weeks the patient may be allowed to sit up a few hours and move about slowly, or take a drive when the weather permits it.

As regards diet, it is necessary, where the irritability of the stomach is very great, and where the pain and vomiting occur frequently, to withhold for a few days (three to eight days) all food by the mouth, and feed the patient entirely by nutritive enemata. And here he has found that a mixture of two raw eggs with two ounces of beef-tea, to which, in some cases, a small quantity of brandy (one ounce) may be added, often acts better than peptonized suppositories, some of which are often passed out quite unaltered. It has been shown by Ewald that the nutritive value of raw eggs, in the form of an enema, without the addition of a peptonizing ferment, is considerable. As the patient often complains of great thirst, small quanties of warm water, or of barley-water, or small pieces of ice, may be given by the mouth. After a few days one may commence cautiously with small quantities of food, such as warm milk, to which lime-water is added, or peptonized milk, peptonized foods, arrow-root, or gruel. The food should be given every two hours, and in small quantities (three to four ounces) at a time. This treatment should be continued for at least three to six weeks, the quantity of food being gradually increased, and the dietary during the last few weeks may be a little varied. Brand's essence, or other similar preparation, may be given with advantage, rice-milk, and (where they are well borne) soft-boiled or raw eggs, or eggs beaten up with milk. Soups of all kinds and beef-tea he has not found useful during the first few weeks of the treatment. In some cases it is necessary that this diet should be continued for months; often a slight deviation from it gives rise to pain; in most cases, however, the pain and vomiting have completely subsided after four to five weeks, and then he found that a diet slightly modified from that proposed by Leube most useful, comprising milk, with stale bread, water biscuits, peptonized food, mutton or lamb finely minced, but without any spices, boiled chicken, soft-boiled eggs, coca, rice, stewed fruit, sweetbread, oysters. After some months, the patient may take fish, roasted fowl, pigeon, rabbit, game, underdone meat, and, of vegetables, small quantities of potatoes and asparagus; of fats, butter and cream are best borne. The foods especially to be avoided are fresh bread, strong tea and coffee, cabbage and other green vegetables, beans, peas, and the heavier kinds of meat, all curries, preserves, cheese, sweets, and cakes.

Alcoholic stimulants are best avoided, and only when all pain and all dyspeptic troubles have subsided, and if the patient is very anæmic, may the light wines or light, home-brewed ale or lager beer be permitted in small quantities. As drink with the meals, warm water, or milk and water, or some of the aerated waters, may be recommended. The dietetic treatment, though the most important factor in the therapeutics of gastric ulcer, has to be supplemented by other measures. For the first few weeks the constant application of hot poultices to the epigastrium will do much to relieve pain. Instead of the poultice, the stomach capsule, first introduced by Leube, may be used. It consists of a concave tin capsule, so shaped as to fit closely to the epigastric region, which can be filled with hot water, and which has a ring on each side, so that it can be easily fastened, and can be worn while the patient moves about. Some recommend Carlsbad salts dissolved in hot water, given the first thing in the morning, as an essential part of the treatment; it is said to act beneficially by neutralizing the acidity of the gastric juice, by stimulating the secretion, by increasing the peristalsis, and by acting as an aperient. As the salt is given when the stomach is empty, the neutralizing effect, as has been pointed out by Ewald, Rosenheim, and others, can only be of use if there is hypersecretion as well as hyperacidity of the gastric juice, and it is doubtful how far an increase of the secretion and an increased peristalsis are useful in these cases at the beginning of the treatment. Acting on the recommendation of some observers, he has used Carlsbad salts early in the treatment of gastric ulcer, but he has so often found patients complaining of pain and discomfort after its administration that he has for the last few years reserved its use for those cases where there is marked gastric catarrh besides the ulcer, and for chronic cases of ulcer, when the acute symptoms have subsided. Instead of Carlsbad salts, he has latterly been in the habit of giving an infusion of senna-pods (eight to ten senna-pods added to about ten ounces of boiling water; the water is allowed to cool, and the pods are removed. Usually six to eight hours after this infusion has been taken, a satisfactory action of the bowels follows. Where the pods give rise to griping, or cause an increase of the gastric pain, he gives as aperients simple or glycerin enemata. Of drugs, bismuth and bicarbonate of sodium are the most useful, and ought to be given in larger doses than are prescribed in the text-books. Where the epigastric pain is very great, Dreschfeld found powders, consisting of fifteen grains of bicarbonate of sodium, fifteen grains of subnitrate of bismuth, and one-twelfth grain of hydrochlorate

of morphine, given two or three times daily, very useful. Instead of morphine, the administration of codeine, in the form of pills, is often to be recommended. Nitrate of silver has, especially on the continent, enjoyed a great reputation in the treatment of gastric ulcer, and one certainly often sees the cessation of pain after its administration. He has often given it from the very beginning of the treatment, either in the form of pills (¼ grain) or in liquid form (⅙ grain) per dose. It may be safely given for some weeks before any argyria is to be feared, and, as a rule, it acts speedily, but where it does not soon relieve the pain its administration should not be continued. With the treatment we may often combine massage of the limbs, especially in neurotic patients.

The treatment here sketched out often reduces the patient and renders him weak, and probably many object to it, and think it unnecessary, as equally good results have been obtained by less stringent measures as to diet and rest. It must, however, be observed that where the treatment has been rigidly carried out, the ulcer has often completely healed, the symptoms all subsided, and the patient been completely cured. Where, on the other hand, the treatment has been less rigid, we often notice a return of the symptoms, and have to fear hæmatemesis or perforation. This rigid treatment is not only to be followed out in undoubted cases of gastric ulcer, but also in those where the diagnosis between gastric ulcer and hysteria or neurasthenia is doubtful, for it will often benefit these cases of functional nervous disease; and, on the other hand, it is chiefly in those cases of gastric ulcer where the symptoms are slight and undefined that fatal perforation most often occurs, as Dreschfeld pointed out before, and a careful and strict treatment in some of the cases given might have prevented the fatal issue.

The after-treatment, when the troublesome symptoms have subsided, should be directed to improve the patient's strength, to regulate the digestive functions, to increase the appetite, and to prevent gastric catarrh and gastric irritation. The diet should be carefully regulated, and anything that gives pain or discomfort avoided; nitrate of silver and bismuth may still be given for a short time, and then replaced by iron, arsenic, and, where it is well borne, quinine. Carlsbad salts or phosphate or sulphate of sodium are useful laxatives. Change of air, especially to a bracing, invigorating climate, of four to six weeks spent at Carlsbad, or, later on, at some of the health resorts with chalybeate springs, are often beneficial, though, except in very anæmic subjects, he has not found that chalybeate waters do much good.

As regards the treatment of the more serious symptoms and complications, Dreschfeld states as follows:

Hæmatemesis is naturally a most serious and troublesome symptom, though, as is generally known, it is rarely fatal. Its treatment is sufficiently well known. It is only necessary to refer to the total abstinence of food by the mouth as long as there is any vomiting of blood, and for a few days after all the vomiting has stopped, and to the administration of turpentine to check the hæmatemesis. Turpentine has for centuries enjoyed a great reputation as a styptic, but in the most recent treatises on gastric ulcer one does not see it mentioned. Dreschfeld could cite several cases of hæmatemesis from ulcer where the patient was pulseless, blanched to the extreme, and where ice, gallic acid, ergotin injections, and all other styptics had been tried in vain, and where the first dose of turpentine completely stopped the hemorrhage, and where the patient afterwards completely recovered. It may be given either in capsules or as an emulsion (one teaspoonful of turpentine beaten up with the white of one egg). It has been well borne in all cases in which it was given, and he cannot speak too highly of its immediate and otherwise satisfactory effects. If the ulcer should give rise to an abscess in the neighborhood of the stomach, we may, if the abscess is situated near the parietes, give relief by opening the abscess and draining it, as in the case given above.

Perforation of the ulcer into the abdominal cavity is almost always fatal. Yet there occur cases where the opening is very small, and where by a localized adhesive peritonitis the small perforation may be closed. Dreschfeld can quote several instances where, in a person suffering from gastric ulcer, sudden pain, great prostration, with quick, weak pulse, cold, clammy perspiration,—in fact, all the symptoms of perforative peritonitis,—appeared, and yet the patient recovered. In one case fatal perforation occurred some weeks later, and the post-mortem examination showed, besides the fresh perforation, recent adhesions closing up the small opening from the previous perforation. The treatment, therefore, in all cases of perforation should be total abstention from food, except in the form of nutritive enemata, subcutaneous injections of ether, and, if the pain is severe, of morphine injection of brandy into the rectum, cold application to epigastric region, hot bricks to the extremities, and abso-

lute rest in recumbent posture. The question of operation in cases of perforation is one which ought most certainly to be considered, but which is very difficult to decide on; if there be great collapse, with quick, small pulse, the operation may be of little avail, as seen from the published cases, and from several cases which have come under my notice; and if there be little collapse and a fair pulse, recovery without an operation is possible, the operation in itself is serious, and may under certain conditions be very difficult. Recent publications show that the site of the perforation can be diagnosticated with considerable certainty, and with recent methods in abdominal surgery the results are distinctly better; if operation is decided upon, it should be performed early. The perforation of an ulcer of the stomach into another part of the intestinal tract—the establishment of a bimucous fistula—may be beneficial if the ulcer bursts into a part of the small intestine; but if, as is mostly the case, the fistular communication is between the stomach and the transverse colon, then we may have either rapid emaciation or stercoraceous vomiting. The great advances in intestinal surgery make it quite feasible that such cases may be successfully treated by operation.

The treatment of dilatation of the stomach, which is of such frequent occurrence in the course of gastric ulcer, requires a few words of consideration. Dilatation may be noticed when the ulcer is still active, as shown by the characteristic pain and occasional hæmatemesis, or it may be a sequence of the ulcer, and due to the stenosis caused by the cicatrix of the healed ulcer. It is important to distinguish these two forms, for while the dietetic and medical treatment is the same for both, the mechanical treatment by washing out the stomach, which may be safely recommended when the ulcer has quite healed, has its risks as long as the ulcer is active. The dietetic treatment will depend, as regards the quality of the food, on the condition of the gastric juice; where the gastric juice contains free hydrochloric acid, and where, therefore, abnormal fermentations are slight, we may give, besides nitrogenous food, a proportionate amount of fat and hydrocarbons. Where the hydrochloric acid is diminished or absent, and the vomited matter contains acetic acid or butyric acid, with large masses of torulæ and sarcinæ, showing that there is abnormal fermentation, then we have to depend chiefly on nitrogenous diet, and here peptonized food becomes particularly useful. In dilatation of the stomach we should limit liquids as much as possible, and only give small quantities of food at the time, and give it often, say every two hours. When the amount of food taken is not sufficient, nutritive enemata will have to be resorted to. As regards drugs, we may here again give alkalies, bismuth, and tincture of nux vomica some time after the administration of food, and pepsin immediately after food, and if there be much flatulence and discomfort, we may give carbolic acid, creosote, the hyposulphites or sulphocarbolate of sodium, or sulphurous acid. Where the hydrochloric acid is diminished or absent in the gastric juice, it should be given instead of alkalies after food. Washing out the stomach is one of the best remedies we have for relieving the troublesome symptoms of gastric dilatation. It may be safely used in those cases where the ulcer is healed, which we may infer, though not always with absolute certainty, when the characteristic symptoms of gastric ulcer have all disappeared for some time; but even where the ulcer is still active, we may—especially when the vomiting and the various dyspeptic symptoms persist—have recourse to the lavage, and if we are careful not to introduce the flexile tube too far, and if we use no great pressure for the irrigation, the risk of hemorrhage is only slight. The benefit which patients have derived from this treatment is so great that Dreschfeld has frequently used the lavage lately, and has never seen any unpleasant effects. Cautious and careful manipulation is, however, to be observed. Lavage of the stomach should not be done oftener than once a day (morning or evening), and should not be continued too long.

The application of electricity in gastric dilatation may do good by stimulating the motor power of the stomach, increasing the secretion of the stomach, and relieving constipation. The faradic current or constant current may be used; if the latter be used, it is best to apply the cathode in the form of a large pad over the epigastrium, and the smaller anode over the middle dorsal region of the spine, and to use a current of 25 to 35 milliampères.

Gentle massage of the abdomen may be tried, but should not be persisted in if the patient complains of pain after its use. In spite of the various measures enumerated for the treatment of gastric dilatation, it happens sometimes that the patient gets very little relief, that the pain and vomiting continues, and that the patient gets weaker and feebler. In such cases operative interference becomes advisable. Other indications for operative interference are repeated, and profuse hæmatemesis, excessive pain, and vomiting.

The operations which have been proposed for the surgical treatment of gastric ulcer, or the cicatricial stenosis of the pylorus dependent on the ulcer, are four in number,—1, dilatation of the pylorus (Loreta's operation); 2, the pyloroplastic operation, introduced by Professor Heineke; 3, pyloric and stomachic resection; and, 4, gastro-enterostomy. A list of the results of forty-seven published cases are briefly given in an appended list which we do not print. According to this list it appears that, of twenty-seven cases of Loreta's operation, ten died immediately after the operation, seventeen cases are recorded as having recovered from the operation, and several of these are reported as still free from gastric troubles some months after the operation; one case was operated on twice. Of pyloroplastic cases, three are recorded, one of which died after the operation; the other two are reported as being well some months after the operation. Of pyloric and stomach resection, thirteen cases, with five deaths and eight recoveries, are recorded; one case had no recurrence of symptoms two and a half years after the operation. Of gastro-enterostomy our record gives five cases, with one death, the death in this case occurring sixteen days after the operation; the other four cases are reported as being well some months after the operation.

THE TREATMENT OF DIPHTHERIA.

The *British Medical Journal* supplement for May 28, 1892, contains the following:

A. Ozegowski (*Nowiny Lekarskie*, March, 1892) strongly recommends the treatment of faucial diphtheria by painting with the following mixture:

℞ Acidi carbolici crystall.,
Acidi citrici cryst.,
Tr. iodi., of each, 3 vel 5 grammes;
Cognac or fine champagne, 100.
M. ft. sol.

Sig.—To be painted on with a cotton-wool swab every two or three hours.

All the numerous cases treated by the author in this way during the last ten years rapidly recovered, although the series included very grave forms of the disease. No toxic effects (from carbolic acid) were ever observed. As adjuvants, Ozegowski advises liberal nutritious diet,—acid drink (lemonade); and, in older children, a chlorate of potassium or chlorate of sodium gargle.

THE NEW ANTISEPTIC—OXYCHINASEPTOL, OR DIAPHTHERIN.

Reasoning from the known fact that the antiseptic value of the phenol compound is increased by the entrance of a lateral group from the benzol ring of a phenol, while the caustic properties are decreased, Emmerich (*Gaz. Médicale de Paris*, June 11, 1892) studied experimentally the bactericidal properties of oxychinaseptol, or diaphtherin,—a combination of phenol-sulphonic acid with two molecules of oxychinolin,—and found that a solution of three-tenths of one per cent. destroyed the staphylococcus pyogenes aureus in thirty minutes, a one-tenth of one per cent. solution destroyed the bacillus pyocyaneus in forty-five minutes, and comma and diphtheria bacilli were killed in ten minutes by a two-tenths per cent. solution. A solution of phenol, lysol, or cresol of considerably greater strength were required to destroy the micro-organisms in the same time. On the other hand, it is quite innocuous, five cubic centimetres of a five per cent. solution injected subcutaneously into guinea-pigs being followed by no serious results. Kronacher has used oxychinaseptol in solutions of one-half to two per cent. with the best results, and no disadvantage from caustic or other action, except that it blackened ragged wounds and imperfectly-plated instruments. Its advantages consist in a powerful parasiticidal and feeble toxic action, its non-irritant properties, and the fact that it is not volatile. It is very soluble in water, and forms a clear solution.

THE CURE OF INFECTIOUS DISEASES BY SUBSEQUENT IMMUNIZING.

Dr. G. Klemperer and Dr. K. Klemperer (*Berliner Künische Wochenschrift*, May 2, 1892) show how laboratory work becomes of practical value in the cure and prevention of disease, especially infectious disease, the experiments upon animals serving to test the value of various methods of producing immunity.

The value of any system of producing immunity depends first upon the degree of immunity obtained by its use, but when it is also to be used as a cure, the question of rapidity also becomes of weight. The infection which is to be coped with does not present itself in full force at the start, but gradually culminates, so, the more rapidly the inoculation works, the less serious the disease which is to be overcome.

The best and most rapid method of effecting it is that discovered by Behring and Kitasato,

who cured animals of diphtheria and tetanus by using the serum of animals known to be already immune. The same has also been done in other diseases.

For the practical value of this method, it is of great importance to know whether it acts specifically,—that is, whether the immunity produced by it has a specific limit. The experiments tried by the authors seem to prove that this "serum-therapy" has a specific action. They next tried inoculating the same animal successively against several diseases. The result seemed successful for two diseases, but is still a matter of experiment.

The authors say that there is no doubt, after the experiments tried, that there is an assured theoretic basis for the use of serum, and its value for mankind is considered possible. The method is most troublesome as now applied, and some simpler method of immunizing, which will produce the same result, should be sought.

ON THE TREATMENT OF HEPATIC COLIC BY ANTIPYRIN.

The *Journal de Médecine de Paris* for May 29, 1892, quotes from the May number of *Les Nouveaux Remèdes* an article of STRISOVER on the successful employment of repeated doses of antipyrin in cases of hepatic colic. Between the paroxysms he prescribed salol and the salicylate of sodium three times a day in the dose of 8 grains. This treatment was continued as long as possible. The salicylate of sodium was dissolved in Vichy water. By means of the salicylates, Strisover believed himself to be able to inhibit the formation of other calculi, and by the administration of 7 grains of antipyrin, as needed, given during the paroxysm, he was able to relieve the pain.

THE TREATMENT OF NEURALGIA BY PURGATIVES.

PROFESSOR E. H. KISCH (*Therapeutische Monatshefte*, April, 1892) urges again upon the practising physician the systematic use of purgatives in the treatment of neuralgia. When the attention is directed to the etiological relation which disturbances of the stomach and intestines, especially habitual constipation, bear to neuroses of various forms, it is surprising how often the former proves to be the prime factor. If the proper course is pursued,—to do away with the digestive disturbance,—the result will be satisfactory. It seems fitting to Professor Kisch to name one group of neuralgic affections coprostatic reflex neuroses, and treat them accordingly.

In diagnosticating a case in which the sensations of pain are prominent in certain nerve-courses, other difficulties and symptoms have been forgotten. The physician following up every symptom, finds the appetite poor, a quick feeling of repletion, pressure, and fulness in the region of the stomach, discomfort, weight, and pressure in the abdomen, belching of gas, flatulence, irregular and scanty excreta, and finally hemorrhoidal affections.

The greatest weight should be laid on these pathological conditions, bearing in mind the reflex nerve excitement, which is caused by those disturbances, especially constipation. In one case hemicrania will be cured, in another intermittent pains in one or more branches of the fifth cranial nerve, or a reflex neurosis, like sciatica or lumbo-abdominal neuralgia. Through systematic excitement of the functions of the intestine, removal of dyspeptic disturbances, rapid cure or improvement will take place in long-standing cases of neuralgia, which have been treated in vain with nervines and narcotics.

Experience shows that dietetic measures of long continuance are best followed at a cure where the patient is removed from his home surroundings, and submits better to the laws laid down as to quantity and quality of food. This fact, in connection with the value of water containing Glauber's salts in regulating stomach and intestinal activity, makes Marienbad, in Professor Kisch's opinion, a very favorable place for the treatment of neuralgia by purgatives. He lays great weight upon the systematic use of the water through a series of weeks. In obstinate cases of constipation he uses with good result mud poultices applied to the abdomen.

As to diet, "too much" must be carefully guarded against, and all foods forbidden which cause constipation, strong red wine, and strong beer. The exact choice of food must depend on individual habits, and especially on the condition of stomach and intestines. The interval between meals should be long enough to allow what has been taken to digest, but not so long as to cause a feeling of exhaustion. The majority of cases which he has observed successfully treated in this way were neuralgias of the trigeminus and sciatic.

THE SUBCUTANEOUS USE OF SALT SOLUTION IN CASES OF INSANITY.

At a meeting of the German Psychiatric Society, held at Karlsruhe, November 7, 1891, DR. GEORGE ILBERG read a paper on this sub-

ject. He experimented with the subcutaneous injection of .75 of salt solution in cases of insanity, where there was persistent refusal of food and threatened exhaustion. Five hundred to seven hundred cubic centimetres of this solution, at a temperature of 30° to 37° C., was allowed to pass slowly into the subcutaneous connective tissue, its absorption being aided by gentle massage. He believed in this method of administering fluid in the presence of symptoms of exhaustion from abstaining from food, and where satisfactory artificial feeding by means of the stomach or rectal tube is impossible. This plan was successfully applied in two cases. In others, where artificial feeding could be accomplished, the solution materially improved the depressed circulation. In those cases where food was not deliberately refused, the patients ate spontaneously soon after the injection. In order to discover why this occurred, he subjected himself to this treatment after a week's low diet. In one hour after the administration of the solution there was profuse salivation, accompanied by a pungent and burning taste. He believes that the patient accepts the food in order to relieve this unpleasant sensation. If this method is not successful, the possibility of recourse to the stomach-tube still remains (*Neurologisches Centralblatt*, No. 23, 1891). — *Journal of Nervous and Mental Diseases*, June, 1892.

DUBOISINE SULPHATE.

Dr. Lewald, in *Der Irrenfreund*, says that as a sedative in mental diseases this drug has no superior. He has used it in a large number of cases, and finds that its hypnotic influence can be depended upon. It is to be administered subcutaneously, in doses of not more than .002 gramme, and is in no case to be decreased.

The author thought that if the drug were more widely known, the time would not be long before it would supersede hyoscine, as it was more effective and possessed less disagreeable properties.—*Journal of Nervous and Mental Diseases*, June, 1892.

THE TREATMENT OF HEMORRHAGES FROM THE UPPER AIR-TRACTS.

At a meeting of the Harveian Society, held Thursday, April 21, Dr. Scanes Spicer (*Medical Press and Circular*, May 4, 1892) made some remarks upon hemorrhage from the nose and naso-pharynx. He urged the determination of the cause of the hemorrhage in every case, and that care be taken not to overlook any grave constitutional condition or fail to treat it. He pointed out the necessity of a thorough examination of the nose and naso-pharynx to determine the exact source of the hemorrhage. He advised, in the first instance, such simple measures as pressure, raising the arms above the head, head thrown back, local application of ice, cold sponging, syringing the nose with hot water, etc. In case these failed, plugging with creolin or other gauze, anteriorly first, and, as a last resort only, posteriorly. He deprecated the use of irritating hæmostatics, such as iron perchloride and turpentine, on account of the serious discomfort they caused. Dealing with recurrent and habitual epistaxis, he thought it to depend very often on septal erosion, in which an artery was periodically opened by accidental detachment of a crust. For this condition he advocated the application of a flat, galvano-cautery point, followed by free use of some ointment, to prevent hard scabs forming. He recommended the prolonged use of the petroleine spray in all cases in which bleeding resulted from crust formation, and cracking of the living membranes in rhinitis sicca, and eczema of the vestibule.

THE USE OF PILOCARPINE IN HYOSCINE-POISONING.

Mr. Evans reports a case of delirium tremens to which he was called after the patient had been ill for some days. Chloral, bromides, and morphine had previously failed to produce sleep, so a 2-minim injection of a one per cent. solution of hyoscine was given, but this also failed. Eight hours later the patient had taken nearly three minims by the mouth, with no better result. In the evening, morphine and chloral were given without effect. Later on, as he could not be kept in bed and was quite unmanageable, a 3-minim injection of hyoscine, of presumably the same strength, but from a different bottle, was given. The patient rapidly became comatose, with dilated pupils and relaxed arteries, rapid pulse, congested face, hot, dry skin, and rapid and deep breathing. Morphine was injected, but without any apparent improvement. Directing that the patient should be energetically stimulated and kept awake, Evans hurriedly obtained some pilocarpine, and then found that the patient could not be roused. Unfortunately, no record of the injections of the pilocarpine was kept. So urgent seemed the necessity of producing symptoms approaching those characteristic of the drug, that injec-

tions were made in the thighs and arms at intervals of about five minutes. In a short time there was a faint reaction of the pupils to light, with a tendency to moistness of the skin, while the breathing and pulse improved; and on his next holding the candle to the face, he was gratified by seeing the patient knock it from his hand, after which rapid improvement took place, followed by complete recovery. Great soreness and itching were complained of next day, the latter relieved by alkaline washes and cocaine ointment. His thighs and arms showed marks of about eight punctures, and he had probably had about two grains of nitrate of pilocarpine. His general health improved under strychnine, red extract of cinchona, etc., so that in a short time he was able to indulge in shooting and billiards, and seemed to have no craving for liquor.—*Lancet*, April 9, 1892.

ADULTERATED IODOFORM GAUZE.

According to the *Chemist and Druggist* for June 11, 1892, one of the German analytical laboratories has detected an adulterated iodoform gauze, which was labelled "iodoform gauze, thirty per cent." It contained eight per cent. of iodoform, and the color had been heightened by a nitrated derivative of phenol.

To detect this adulteration, the gauze should be plunged in water, when the water becomes of a yellow color. Pure iodoform gauze does not yield its color to water.

THE ACTION OF DIGITALIS IN CASES OF AORTIC REGURGITATION.

In the *British Medical Journal* for June 4, 1892, DR. GEORGE W. BALFOUR, of Edinburgh, contributes an article upon this subject. After calling attention to the widespread opinion that digitalis is contraindicated in aortic regurgitation, he calls attention to the fact that the late Professor Easton, of Glasgow, pointed out that when the heart beats less frequently, there is less opportunity for regurgitation, and not greater. When a heart beats forty times a minute, there are only forty regurgitations per minute; when the heart beats ninety times a minute, there must be, of course, also ninety regurgitations. But, it is argued, that though the regurgitations are fewer, they are more prolonged, therefore greater in amount and more dangerous to the maintenance of the integrity of the circulation. But a prolonged diastole does not necessarily signify an increased reflux. Within the vascular system there is neither air nor a vacuum, but one unbroken column of blood extends from any given point within it back to itself again. The heart is the only part of this system endowed with the power of active movement, and upon it the circulation of the blood depends. When the left ventricle of the heart contracts, it propels its contents into the aorta, that vessel, already full of blood, by virtue of its elasticity, expands, and receives this further supply thrown into it. When the systole of the ventricle is completed and its diastole commencing, there is developed "a negative pressure in the rear of the column of blood driven from the ventricle into the aorta with great suddenness and rapidity." This negative pressure follows the blood past the semilunar valves, and, in the normal state, it in part, at least, determines the closure of these valves. This negative pressure, which is greatest within the ventricle, is largely due to the return of the ventricle from its contracted to its normal form. At the end of the ventricular systole the segments of the mitral valve form a depending cone, with its apex directed to the apex of the ventricle. This cone is full of blood in free communication with the auricle, now fully distended, and at the moment of diastole the sucking influence of the negative pressure within the ventricle opens up its apex, the blood closely follows the expanding wall of the ventricle, and gently floats up and into apposition to the segments of the mitral valve. At the moment of the ventricular diastole, the systole of the aorta takes place, this vessel returns to its normal dimensions. In the normal man the systolic compression of the blood within the aorta helps to close the semilunar valves, but the whole amount received from the heart is propelled onward. When the aortic valve is incompetent, the systole of the aorta, coupled with the negative pressure within the ventricle, determines a certain amount of regurgitation which can never be equal to the amount propelled, otherwise the circulation would at once come to a standstill. This reflux has been calculated as amounting to one-third of the whole ventricular contents, and is probably usually considerably less than this. Under the influence of the aortic systole and of the intraventricular negative pressure, the blood from the aorta and from the auricle closely follows the wall of the ventricle during its expansion, fills up its cavity, and floats up and into apposition to the segments of the mitral valve. So soon as the ventricle has returned to what Foster calls its normal condition, its active expansion ceases, and a period

of rest or quiescence sets in, during which the blood within its cavity, in the aorta, and in the auricle comes under the influence of hydrostatic laws only.

The most important of these laws in regard to aortic regurgitation is that to which the name of its earliest enunciator—Pascal—has been given. "Pressure exerted anywhere upon a mass of liquid is transmitted undiminished in all directions, and acts with the same force on all equal surfaces, and in a direction at right angles to those surfaces." The law has a probable influence in promoting the gradual dilatation of the left ventricle when the aortic valve is incompetent, but it acts very slowly, as one of the corollaries of Pascal's law is that what is gained in power is lost in velocity. There is also another and, from the present point of view, a more important corollary to Pascal's law, and that is that the pressure transmitted by a liquid is proportional to the extent of its surface. Now, the area of the mitral opening may be taken at 1.25 square inches, and the area of the abnormal orifice at .25 of a square inch; never more, often very much less. The ratio of the respective surfaces of these openings is thus as 5 to 1. From the mere surface point of view, therefore, the blood column in the auricle is four equivalents in excess of what is necessary to counterbalance the blood column in the aorta, and it acts perfectly favorable, because there is a third corollary from Pascal's law which states that the upward pressure of liquids at any point is governed by the same laws as the downward pressure. We may, however, suppose the pressure of the aortic blood column to be equivalent to the blood-pressure on the sound aortic valve, which the ventricle has to overcome before the segments of that valve are thrown open and the blood projected into the aorta, equal, therefore, to a pressure of two hundred and fifty millimetres of mercury, or three metres of blood. But then we must also remember that from the absence of capillary resistance, and from the non-existence of vasomotor nerves within the lungs, the mechanical effect of the systole of the right ventricle makes itself felt from the pulmonary artery to the left auricle, and this has been calculated at one-fourth of the force of the left ventricle,—sixty millimetres of mercury, or three-fourths of a metre of blood. These figures multiplied by five, to bring them to the proper ratio, give more than enough of upward pressure—three hundred millimetres of mercury, or three and three-fourths metres of blood—to prevent any regurgitation from the aortic orifice. But if we consider that the filling up of the ventricle detracts somewhat from the intrapulmonary pressure, and suppose that the blood passes through the mitral orifice at the pressure of only six inches of blood, as Davies has done, then we must also allow for the reduction of blood-pressure by regurgitation from the aortic column; and this, coupled with the patency of the valves, would seem to reduce the pressure in that column to that of about eighteen inches of blood, or the height of a column of blood reaching from the base of the heart to the top of the head. But the pressure at the mitral office,—six inches, multiplied by five, its proportional area,—gives a relative pressure of thirty inches at the mitral orifice, much more than sufficient to prevent all regurgitation through the aortic orifice during the quiescent period of the diastole.

A slow pulse, therefore, not only gives fewer opportunities for regurgitation; but, though it is indubitably accompanied by a prolonged diastole, the regurgitation is not thereby increased, the reflux is actually diminished by a slowing of the heart's action, and the balance of the circulation made more equable. The action of digitalis, therefore, in slowing the heart is not hurtful in aortic regurgitation, but beneficial. But apart from its action in slowing the heart, which is a mere accidental or secondary effect, digitalis possesses pre-eminently the properties belonging to what is called the digitalis group of remedies. It increases the elasticity of the muscular tissue, so that this extends and contracts more completely and perfectly, and as all the blood passes more frequently through the heart than through any other muscle, this action is specially exerted upon it, and is manifested at a time when the other muscles are practically uninfluenced. The importance of such an action on a failing heart cannot be overestimated; in all cases of ruptured compensation in mitral incompetence we are accustomed to rely upon it with the utmost confidence, and are rarely disappointed. Why should we have misgivings in aortic incompetence? In the early stages of aortic incompetence the heart is well fed, every part of it is flushed with blood, which, from the increased size of the blood-wave and the position of the coronaries, must beat first, at all events, at an abnormally high pressure; the nutrition of the heart is specially well provided for, there are no symptoms, and no treatment is required. When, from any cause, however, the compensation is ruptured, an aortic heart will be found as amenable to the beneficial influence of digi-

talis as any other failing heart, but larger doses are required, but little influence is produced by less than three times as much as would suffice for a mitral heart. Even should the pulse under treatment become abnormally slow, which is not at all usual, and certainly not needful to secure benefit, we may rest assured that excessive regurgitation is not then promoted; and though sudden death is not at all unlikely to happen in a badly-compensated aortic heart, whether it is treated with digitalis or not, digitalis is never to blame for this. On the contrary, the judicious use of digitalis is the most efficacious treatment in all cases of failing heart, whether that failure be accompanied by aortic or mitral regurgitation. In failure dependent on arterio-sclerosis alone, the tonic influence of digitalis on the heart is hindered unless we combine it with some drug which unlocks the arterioles, and so prevents an increase of the blood pressure, already abnormally high.

HYPODERMOKLYSIS.

Dr. Max Hildebrand, of San Francisco, Cal., has contributed a paper to the proceedings of the California Academy of Medicine, which has been published in the *Occidental Medical Times* for June, 1892.

Hypodermoklysis consists, as the term implies, in the introduction of fluid under the skin, in order to wash out the system through the natural channels of circulation. In the experiments that were made by Dastre and Loye, about three years ago, on dogs and rabbits, a .7 per cent. solution of chloride of sodium was employed, and injected directly into the veins of the animals. Four times the amount of the normal quantity of the blood may be infused in this manner without any danger to the life of the animal on which the operation is performed.

In the first place, the most remarkable fact may be mentioned that the blood-pressure, which could reasonably be expected to increase, after the infusion, from general plethora, is by no means higher than before. The diuretic effect of the infusion becomes apparent about two or three hours afterwards. The infusion of this so-called physiological solution may be regulated in such a manner that within fifteen minutes for every pound weight of the animal's body one drachm of the solution is passed into the blood-current. Thus, for an ordinary dog, weighing about twenty pounds, the maximum harmless quantity of salt water infused into his system would be about two drachms per minute, and, if this ratio is kept up, the infusion may last for hours, with the result that the same quantity of urine is discharged as salt water is passed into the system. If, however, the pressure of the salt-water injection—that is, the rate of the current—is increased above these figures, the accumulation of water in the system proves fatal to the animal, because the kidneys cannot evacuate it as speedily as it is injected. The infusion takes place in such manner that, if a certain quantity of the solution has been deposited within the walls of the blood-vessels and within the tissues of the body, diuresis sets in, and the quantities of the injected and discharged fluids are perfectly balanced. If at this moment any more solution was injected, it would be exactly as if fluid was passed into a cask already full, that of necessity must run over.

While infusion is going on, the urine of the animal becomes gradually paler, and diminishes both in specific gravity and in its mineral constituents until it is almost similar to the fluid injected. In this way the tissues of the body are, as it were, washed out, and more urine is carried off than would have been possible without the infusion. It may be stated here that albumin does not appear in the urine during the process. It must, however, be remembered that the infusion of the physiological solution into the veins of animals is only a harmless operation, provided the heart is perfectly healthy, otherwise the increased tension of the right ventricle may prove a source of serious danger to the animal. Even if we leave this circumstance out of account for a moment, it is proved by the experiments of Roux and Yersin (*Annales de l'Institut Pasteur*, 1889, "Contributions à l'Étude de la Diphthérie") that the treatment by means of salt-water infusion of animals that were poisoned with different bacterial products have given very bad results. Under these circumstances it would have been out of the question to use the direct infusion of salt water into the veins in the treatment of diseases in man. It was necessary to find a method that could produce the beneficial effects of the infusion, and at the same time avoid its dangers.

The merit of the discovery of this new method is due to Cantani, who first conceived the brilliant idea of injecting the physiological solution hypodermically, and named it "hypodermoklysis." It was employed by him in two different conditions,—exhaustion after severe losses of blood and in cholera. His purpose was to replace the loss of water, and in this way to overcome the drying up of the tissues.

But this is not all. We know that a great many diseases, the nature and the origin of which were recently a sealed book, are produced either by the excretions of microbes living in our bodies or by the physiological excretions of the body itself. The investigations of Brieger leave no doubt that both yield a variety of highly poisonous substances, which are either alkaloid, produced by decompositions, and called ptomaïnes or toxines, or are derivatives of pathogenic bacteria, and called toxalbumines. Toxines and toxalbumines, when brought into the circulation, give rise to extremely dangerous intoxications. It has been proved by the investigations of Bouchard, Roux, and Yersin that in many diseases, especially those combined with fever, the poisonous substances, which circulate in the blood, leave the body by way of the kidneys, and it is a well-known fact that in different morbid conditions—for instance, in uræmia, typhoid fever, cholera, tetanus, etc.—the reappearance of a copious discharge of urine is considered a sign of favorable prognosis.

The introduction of saline infusions in the regular treatment of diseases has opened a new and extensive field for medical action. The results that have been published by careful observers of different nations have contributed to establishing this method as a most powerful remedy in cases where formerly the physician was compelled to retreat with resignation from the field of action. The method of performing the infusion is very simple. A glass vessel, containing about thirty to forty ounces, is filled with a sterilized solution of 7 parts chloride of sodium and 1000 parts of water (about three and a half grains to the ounce). The temperature should be about 110° F. A glass siphon leads through a tight stopper from the vessel to an india-rubber tube ending in a large-sized trocar. A glass pipe, filled at the upper end with sterilized cotton, leads to the bottom of the vessel for the purpose of admitting the necessary air. It is unnecessary to add that the utmost care should be taken that all parts of the apparatus be sterilized. The best place for the injection is the abdomen. As soon as the trocar is pushed through the skin into the cellular tissue the saline solution is injected by holding the glass vessel about four or five feet above the abdomen of the patient. The time required for infusing thirty ounces is about five minutes. While the infusion is going on, a tumor is gradually formed, the contents of which are absorbed by the cellular tissue in about three hours. While it is true that the formation of this tumor is rather painful, on account of the tension of the skin, it must be remembered that in the majority of cases in which the operation is performed the patient is in a semiconscious condition, and in the remainder it disappears in two or three hours.

The effect of the operation in some cases is simply surprising. Where, only a few minutes before, pulse and respiration had ceased, and all hope was abandoned, a perfect change may take place, and a rather abrupt inspiration indicates the return of the patient to life. In other cases the good result is apparent more slowly, and is often denoted by increased diuresis and lower temperature. As the indications for saline infusions are so manifold that their enumeration would far exceed the limits of this paper, I will only mention the most important.

In the first place, saline infusions have proved successful in cases where severe loss of blood had occurred, and, as has already been mentioned, in cholera. It has been employed by Sahli, of Berne, in cases of uræmia and of typhoid fever, with excellent results. He says that, apart from the diuretic effect of the infusions and the washing out of the system, he is of opinion that great stress should be laid upon the fact that the specific poisons in the tissues and in the blood are diluted by the infusion. He also points out the importance of the possibility, in typhoid fever, of introducing sufficient quantities of water into the body, notwithstanding the presence of diarrhœa and prostration of the digestive organs, and thus counteracting the drying up of the tissues. Besides these cases, hypodermoklysis has been successfully employed in the following conditions: Septic blood-poisoning, diabetic coma, gastric or intestinal ulcers, and anæmia; and Sahli recommends it very strongly in cholera infantum, although he has not tried it himself in this disease.

From his own experience, Hildebrand can very strongly recommend it in asphyxia from chloroform. In two cases under his observation it acted promptly, after electricity and artificial respiration had failed. He would, however, unhesitatingly employ it, as the only means of saving life in intoxication from alcohol, morphine, carbonic oxide, and in all apparently hopeless cases of snake-bite. Hildebrand is perfectly certain that many lives would be saved in this way. Of course, time and careful observation alone will show whether hypodermoklysis is as powerful and expedient a remedy as, judging from present stand-points, could reasonably be expected.

TOXIC INFLUENCE OF ANTIPYRIN.

In the *Birmingham Medical Review* for June, 1891, DR. T. SYDNEY SHORT reports a case in which antipyrin exercised a toxic influence. A professional man, who had taken antipyrin a number of times, always had the following symptoms: Redness and œdema of the face; great swelling of the lips and one side of the nose, with herpetic eruption; a scarlet rash, accompanied by œdema of the subcutaneous tissue of the hands, feet, penis, and scrotum; ulcers on the mucous membrane of the mouth, following herpetic vesicles; an acute inflammation of an herpetic nature round the anal margin, and pain and stiffness in the muscles of the back and shoulders. The first attack occurred in March, 1891, the second in October of the same year, and the third attack, which is the one described, on March 5, 1892. On this day, feeling tired, after more than usual exertion, with symptoms of a severe headache approaching, and a social engagement for the evening in view, he took 5 grains of antipyrin crystals in water, and went to sleep for an hour before leaving home. He felt considerably refreshed on waking, but a slight headache still remained. In two hours' time his friends noticed that his face was unusually flushed, and four hours after the drug was taken, when at supper, he felt a choking, unpleasant feeling in the throat, which was followed by a tingling and itching sensation in the skin of the nose and the lips, with swelling and redness. The feeling of fulness in the throat passed off in about half an hour, but the swelling and redness of the face continued, and by the time he reached home and went to bed, between eleven and twelve, both lips and the left side of the nose were enormously swollen, painful, and itching, with a tense and shiny appearance.

When seen the next morning the swelling was still present, and was surmounted by several large vesicles on the nose and lower lid, discharging a thin serum; the tongue was swollen and covered all over with a white, thick fur, while numerous little vesicles, like herpes, were seen on the insides of the cheeks and lower lip. The hands and feet were swollen, and bright scarlet in color, the rash being exactly limited by a line drawn round the wrists and ankles; the skin of the penis and scrotum was also swollen and red with herpetic vesicles. There was intense itching all over the reddened skin, and on one finger, where a ring was embedded in the swollen tissue, there was a blister at the margin of the depression thus formed. No rash could be seen on any other part of the body, and the patient looked as if he had dipped his hands and feet in a scarlet dye. There was great pain in the anal region, where the skin and mucous membrane were swollen and discharging serum. He had a little pain on movement in the muscles of the neck, shoulders, and back, with a feeling of stiffness in those regions. There was no rise in temperature, no vomiting, and no collapse.

During the second day the bowels were opened by a smart saline purge, which caused the greatest pain, so severe that morphine had to be administered, the local application of cocaine failing to give relief. The small vesicles in the mouth became ulcers during the next day, and these, about fifteen to twenty in number, presented a circular, punched-out appearance; the tongue had cleaned, and was quite raw, with long papillæ standing out like the pile in plush. The inside of the mouth was so extremely tender that the tongue could scarcely be moved, and even liquid food of the blandest description could only be borne by brushing over the tongue and the ulcers with a ten per cent. solution of cocaine, and any liquid containing a trace of acid or salt could not be tolerated at all. The itching of the skin and the serous discharge remained about the same.

By the end of the fifth day the vesicles on the nose and lips had scabbed over, the swelling in all parts had subsided, but not disappeared, and the mouth and anus still remained terribly painful. Pure carbolic acid applied to each of the ulcers in the mouth relieved the pain to some extent, and by the sixth day a bland spoon diet could be taken without the application of cocaine. During the next twenty-four hours a rapid improvement took place, the mouth and anus were nearly healed, all the redness and itching of the skin had gone, and the nose, now completely scabbed over, ceased to be painful.

On the eighth day he was practically well, although the interior of the nose remained sore for several days after. A slight desquamation appeared on the hands and feet about two days after this, and continued for some three weeks before it ceased completely. That antipyrin was really the cause of the symptoms was not suspected until the third attack, and then, unfortunately, an emetic was out of the question until some hours had elapsed from the time they were well marked, and even on this occasion it appeared sufficiently doubtful at first that the drug was the actual cause.

On reviewing the history of the case, it was found that the three occasions on which these

attacks occurred were the only occasions during the whole year in which antipyrin was taken, and the first symptoms were found to have been noticed about four hours after the drug was swallowed in each case. It was thought at first that fish might have been the cause of the earlier attacks, but on many occasions during the twelve months, fish of all kinds was taken with no untoward result, and before the last attack no fish had been taken for several days.

One point is worthy of mention. It was found out on inquiry that each time the antipyrin had been taken it was in the solid form; on each of the earlier occasions a tabloid of five grains had been swallowed like a pill, and on the third the fresh crystals had been stirred up in water and drunk off before they were dissolved. Whenever he had taken antipyrin before it had always been dissolved in quite an ounce of water, and no unpleasant symptoms had occurred, so that it is possible the solid form, coming in contact with the mucous membrane, produced an effect that a proper dilution would have prevented.

THE TREATMENT OF CONGENITAL CATARACT.

DOR (*Recueil d'Ophthalmologie*, May, 1892), in the French Society of Ophthalmology, held at Paris, May 2 to 5, 1892, expresses the following views in regard to the treatment of congenital cataract. The following division was made: Pyramidal cataract, zonular cataract, nuclear or central cataract, total cataract, and unusual forms of cataract,—for example, central punctate cataract, fusiform cataract, etc.

In the immense majority of cases of pyramidal cataract the vision is not reduced less than two-fifths, and no treatment is required. Nevertheless, when the pyramidal cataract is more extended, especially if there are remains of the pupillary membrane or of posterior synechiæ, and if the vision is less than one-third, an operation may be very useful,—namely, an optical iridectomy.

In zonular cataracts, described for the first time by E. Jaeger in 1854, the crystalline opacity occupies one or more perinuclear zones, while the nucleus and the cortex are transparent. Sometimes the cortex shows slight radiary or dotted opacities. Under these circumstances the cataract is not always stationary and may become complete, but only after long years and much less frequently than is ordinarily admitted. As a general rule, when the diameter of the opaque zone does not exceed from five to five and a half millimetres, the cataract should not be operated upon, especially when, after having dilated the pupil and corrected any anomalies of refraction, a distant vision equal to one-half is obtained. In this case and under these circumstances the ideal operation is iridotomy or sphincterotomy, but as it is difficult of execution, and sometimes associated with serious dangers, it is preferable to perform a simple iridectomy, which must be made as small as possible, and without excising the iris up to the periphery.

The operation of dilatatorectomy (Prouff, Pope, Demotkine) or pericorneal iridectomy (Schoeler, Fischer)—that is, a peripheral iridectomy, with preservation of the sphincter, a procedure described by Carter in 1875—does not yield, from an optical point of view, as good results.

Iridocleisis (Adams, Himly) and iridodesis (Critchett) are methods which have been abandoned.

If it is decided to operate upon the cataract itself, then, when the diameter of the opacity exceeds five and a half millimetres, the choice of an operation will depend upon the age of the subject. Up to the age of from eight to ten years, discission alone, repeated, if necessary, several times, will be sufficient in all cases. It is preferable to make the discission with two needles, according to Bowman's method, and Dor prefers needles made of platinum, which can be heated just preparatory to the operation. From the tenth to the twentieth year complete opacification of the cortical portion of the lens may be secured by discission, and then, four or six weeks latter, a linear extraction may be performed, according to the method of Von Graefe. After the twentieh year it is preferable, after one or more preliminary discissions, to make an extraction by section, with or without superior iridectomy.

Many authors have described different forms of nuclear congenital cataracts. In some the opacity had perhaps begun in the nucleus, but in almost every case they were real zonular cataracts, whose opaque portion is so thick as to prevent the detection of the translucent central part. Nevertheless, in many cases, the central parts in turn become opaque, probably secondarily. (Schirmer proposes to call them central cataracts.) The treatment is the same as that for zonular cataracts, and in some cases it is necessary some time after the discission to extract the nucleus.

In total cataracts the chosen operation is discission. Cases have been observed in adults, or in persons of at least 15 years of age,

in which the cataract was shrivelled up, and had the appearance described by the name *arido-siliquata*. In this case extraction with the capsule must be performed with the capsular forceps. It is important in cases of total cataract to perform an operation as early as possible, in order that the retina may be properly stimulated by the sensations of light, and its functions normally performed. Suction and aspiration (Bowman, Critchett, Little, etc.) are methods abandoned even by the English.

The unusual forms of congenital cataract—starred, dendritic, central punctiform and fusiform cataract—either demand no operation, the vision being sufficient, which is most frequently the case, or they require iridectomy when the peripheral parts of the lens are transparent, or, finally, they must be treated as zonular cataracts.

SOME CORNEAL TROUBLES CONSEQUENT UPON EXTRACTION OF CATARACT.

NUEL (*Recueil d' Ophthalmologie*, May, 1892), in the May meeting of the French Society of Ophthalmology, referring to the corneal complications consequent upon extraction of cataracts, describes two varieties. In one striations arise perpendicular to the section, which gradually disappear. In the other there is a milky opacity, uniform all over the cornea, a serious affection which never yields to treatment. The first variety, usually called striated keratitis, according to Nuel, is due not to cocaine nor to the sublimate solution, but to the imbibition of aqueous humor through little cracks in the endothelium, which are produced by the compressing bandage, which causes corrugation of the corneal surfaces. The milky opacity is due to the penetration of sublimate into the corneal lamina. The natural preventive measure, on the one hand, is the use of a compressing bandage which is not too tight, and, on the other hand, to prescribe aseptic cleanliness. Only asepsis should be employed, using a solution of chloride of sodium, and never a sublimate lotion after the corneal incision. The same method should be pursued at the time of the dressings as when cicatrization of the cornea is not yet complete.

In the discussion which followed, Chibret remarked that in almost all cases of extraction he used antiseptic intraocular injections with a solution of cyanuret of mercury, 1 to 20,000, salted to 7 per 1000. Among three hundred cases treated in this way he has observed one opacity. He does not think, therefore, that it is necessary to dispense with cleansing of the anterior chamber, and still less with antiseptic solutions.

Gillet de Grandmont believes that striated keratitis, or trabecular keratitis, is due to circulatory disturbance in the cornea. The striæ are due to leucocytes which are about to pass out of the level of the iris angle. Encountering the corneal section, they cannot pass, and accumulate in the lymphatic spaces. On the whole he agrees with Nuel that the milky opacity is connected with the action of the sublimate.

Pflüger, who was one of the first to attribute these corneal troubles to the action of sublimate, has dispensed with antiseptics, and since this time has never observed these opacities. He uses exclusively a solution of trichloride of iodine.

Galezowski has found sublimate to cause these opacities, but has had none to occur since he has been accustomed to use a carbolic acid solution.

De Wecker thinks that to antiseptics must be attributed these corneal complications. Nevertheless, boric acid solutions are not dangerous.

Gorecki recommends as an excellent preparation an albuminous solution of boric acid combined with a solution of sublimate. The sublimate coagulates the albumin of the solution, and then leaves the cornea intact.

Jocqs thinks it is generally agreed that the corneal opacity, either total or partial, should be attributed to the action of the sublimate, either in intraocular injections or in extraocular lotions after the operation. He has observed two cases of partial infiltration of the cornea, which persisted for five or six days after the operation, when he had employed an extraocular cleansing with a solution of sublimate, 1 to 5000, *before* the operation.

SUTURE OF THE CORNEA IN THE EXTRACTION OF CATARACT.

SUAREZ DE MENDOZA (*Recueil d' Ophthalmologie*, May, 1892) communicated to the French Society of Ophthalmology fourteen cases of suture of the cornea in the extraction of cataract, by the process which he had made known at the last Congress, and which may thus be summed up: Placing of the thread, extraction of the crystalline lens, suture, immediate coaptation of the wound, restoration of the anterior chamber in two hours following the operation; recovery in the sixth or tenth day.

SPHINCTEROTOMY.

GALEZOWSKI (*Recueil d'Ophthalmologie*, May, 1892) observes that in the operation of incomplete cataract, there is often present a large lens, which is delivered with difficulty and bruises the iris at the time of its extraction. This leads to iritis, synechiæ, and secondary cataracts. Therefore he thinks it advantageous to add to his method of operation in the extraction of immature cataracts a semi-elliptical incision, or a sphincterotomy. This avoids the contusion of the iris, and as a simple section of the pupillary sphincter is insignificant, it greatly facilitates the passage of the crystalline masses.

EPIPHORA AND DACRYOCYSTITIS.

CHAUVEL (*Recueil d'Ophthalmologie*, May, 1892) gives some statistics in regard to dacryocystitis, both simple and complicated, as it occurs in the army. The treatment which was generally followed both by his colleagues and himself consisted in the opening of one of the lachrymal canals and the passage of Bowman's probes. At one time he followed the rule of dividing the whole length of the canaliculus clear into the lachrymal sac. Later, however, he has observed that this long section is useless, and he has been satisfied with a division of two or three millimetres, just sufficient to permit the introduction of the largest metallic probes. He has been accustomed to use Weber's knife for the section of the canaliculus, but thinks that it is not a satisfactory instrument in all cases, either because the knob of the bistoury strikes against a fold of mucous membrane, instead of reaching the internal wall of the sac, or, in raising the handle, the tissues are not tight enough to be divided. After the incision is made, a boric acid compress is applied to the spot. The probe is not introduced until the third day, at which time a No. 3 Bowman's probe is utilized, Nos. 1 and 2 being rejected because they are more likely to injure the mucous membrane. At the end of this time it is practically always possible to introduce the probe without injury. By waiting in this way he has introduced a No. 3 probe in seven cases, a No. 4 in thirteen, a No. 5 in eleven, and, finally, in six cases, a No. 6 probe. Probing was performed only every two or three days, or—and this was the most usual course—every morning during the visit. Injections of an astringent or slightly caustic solution are often utilized; for example, sulphate of zinc, nitrate of silver, and chloride of zinc, so introduced that they shall act upon the whole extent of the mucous membrane. This briefly has constituted the treatment, except under special circumstances requiring particular lines of treatment owing to complications.

Chauvel is not satisfied with this treatment, however, and under this method records eight successes, eighteen ameliorations, and twenty-three failures. In acute cases success to a certain extent is the rule. In chronic suppurations, diminution of the purulent material is often obtained. Sometimes it disappears, but the watering continues even after the greatest dilatation of the ducts. He has purposely made a record of these cases to show that a treatment which still continues to have many adherents has been singularly inefficient in his hands.

A SIMPLE METHOD OF TREATING MANY CASES OF LACHRYMAL OBSTRUCTION.

DR. GOULD (*New York Medical Journal*, June 4, 1892) advises the following method: First empty the sac and canaliculi by dexterous pressure, and cleanse the eye and palpebral pockets of this unhealthy material. Then cant the patient's head back and to one side, or have him lie so that a teaspoonful of liquid will be held in the depression formed by the nose, orbital border, and superior maxilla. Fill this space with a solution of boric acid,* and with the little finger again slowly empty the sac and canaliculi by pressure, and then, as slowly lessening the pressure, allow these spaces to refill, by suction and capillary attraction, with the solution under which the puncta are submerged. Again, in half a minute empty the canaliculi and sac by pressure, but this time beginning the pressure from the canthus towards the nose and downward, so as to force the antiseptic solution downward into the duct. These alternate emptyings and refillings of the sac may be repeated several times, and as often as desirable to meet the indications of the case. It will usually be found that the sac will soon become healthy, and that pressure upon it will not cause regurgitation of morbid material through the puncta.

A certain number of cases, however, will not yield to this treatment. There is too great stenosis or spasmodic contraction of the muscular sphincter of the punctum, etc., so that the cleansing solution cannot be forced into

* The solution he uses is composed: To the ounce of distilled water, of boric acid, ten grains; common salt, three grains; chloride of zinc, one grain; deeply tinted with pyoktanin-blue, and doubly filtered after long standing.

the sac and duct. In such cases he inserts one sharp point of the iris scissors into the punctum, and snips it open about one-eighth of an inch, perpendicularly downward towards the conjunctival fold. This gives a larger opening for the indrawal of the solution.

CONDITIONS DEMANDING EXCISION OF THE GLOBE OF THE EYE.

At the meeting of the American Surgical Association, DR. W. H. CARMALT, of New Haven, Conn., read a paper which discussed the indications for enucleating an eye. The chief points are contained in the following abstract:

In the case of blind eyes, the objections to the operation are two,—1, the danger of the operation *per se;* and, 2, the cosmetic appearance. Meningitis has occurred in some cases operated on in the acute stage of suppurative panophthalmitis. In these cases, the removal should be made as soon as the evidences of suppuration are unmistakable. In cases of lacerated or penetrating wound, with loss of vision, the operation is better done before suppuration occurs, or as soon as the evidences of suppuration are sufficiently plain.

There is no one condition for which eyes are so frequently excised as in sympathetic ophthalmitis (threatened or actual). The pathology of the sympathetic process is still a matter of controversy. In a case presenting the irritative symptoms, indicating the beginning of sympathetic ophthalmitis, with the other eye lost from injury, or certain forms of disease yet to be mentioned, it is the duty of the surgeon to advise in the most unqualified manner the enucleation of the blind eye. The irritative stage is usually short. It is more or less rapidly followed by diminution of vision, due to an organic lesion. In the acutely inflammatory stage of the sympathetic disease, the removal of the "excitor" is not so beneficial to the "sympathizer," and may be harmful, adding fuel to an already flaming fire. In these cases the operation should be postponed until the active process is subdued. It must also be remembered that in a small number (perhaps about ten per cent.), the sympathetic inflammation may come on after the removal of the excitor, and in about two per cent. it has been thought to have been the result of operation.

The conditions liable to give rise to sympathetic ophthalmitis are, 1, injuries; 2, diseases. *Injuries: a,* lacerating or perforating wounds, so severe that the result will inevitably be atrophy of the globe; *b,* the lodgement of a foreign body in the interior of the globe; *c,* a penetrating wound involving the ciliary region. *Diseases: a,* recurring or chronic irido-choroiditis from whatever cause; *b,* atrophy of globe, following purulent keratitis or panophthalmitis, or in which ossific degeneration of the choroid has taken place; *c,* atrophy of the globe from any cause, with painful ciliary region. Time does not confer immunity against sympathetic disease. There is considerable difference as to liability to the disease in the various injuries and diseases. This sequence is more frequent after injuries than after non-traumatic diseases, and of injuries nothing is so potent as the lodgement of a foreign body in the eye.

The pain which comes from the intraocular pressure of a chronic glaucomatous degeneration is frequently so excessive as to justify the removal of the offending organ, other means of treatment having failed.

Various diseases of the eye leave the organ in conditions so inconvenient or repulsive in appearance that the surgeon's aid is sought for purely cosmetic purposes. Are there, however, no procedures that may be substituted, and avoid so severe a mutilation? In earlier days of ophthalmology, abscission of the anterior segment of the globe was often practised. In this operation more or less evisceration of the contents of the globe takes place. As a matter of fact, the result is about the same as after enucleation, and sympathetic ophthalmia may follow the operation. The opinion of the author was decidedly against such risky procedures,—enucleation of the misshapen eye, with the introduction of an artificial eye, is the only admissible operation. The modern expedient of tattooing a white cicatrix of the cornea without staphyloma has resulted in sympathetic disease.

The enucleation of blind eyes that are the seat of phosphenes, like many operations undertaken to relieve a symptom of nerve irritation, is of doubtful utility.

In regard to the enucleation of eyes only partially blind, it goes without saying that a condition of things which can allow it to be seriously contemplated must apply with greater force to eyes already blind. The chances of accident or independent disease to the remaining eye are sufficiently great to justify the statement that nothing but the certainty of ultimate blindness to both, or of death, can permit us to consider such a procedure.

Most of the intraocular tumors are sufficiently dangerous to life to demand the removal of the organ in which they are con-

tained, as the only hope that can be entertained of successfully combating their encroachment. They are of two classes,—the granulomata and the sarcomata.

The extraocular growths are of greater variety of histological structure. In sarcomata of the orbit, removal of the globe is often required, even when not implicated in the disease.

Should an eye which retains an appreciable degree of vision be removed in order to arrest a threatened or prospective attack of sympathetic disease in the fellow? It is certainly unjustifiable to remove an injured but still seeing eye, though it may be an excitor of sympathetic disease. The result of the operation has not been sufficiently successful in arresting the progress of the malady after it has begun to warrant its recommendation. The only condition in which it was considered justifiable to remove a still seeing eye, for sympathetic disease, is where a foreign body remains in the eye. In these cases sympathetic disease is very apt to follow.—*Journal of the American Medical Association*, May 28, 1892.

A PRACTICAL METHOD TO BE USED IN PLACE OF THE DECALCIFIED BONE PLATES OF THE SENN OPERATION.

VON BORACZ (*Centralblatt für Chirurgie*, June 11, 1892) cut plates from beets, apples, potatoes, radishes, carrots, red beets, and other vegetables which could be digested in the bowel. After much experimenting with the resisting power, the author found that the Swedish turnip answered all purposes.

From this vegetable he cut plates similar to those of Senn. Through the edges of these plates a linen thread is drawn, and by this means the degree of resistance can be determined.

The preparation of the plates is as follows:

A fresh and sound Swedish beet is selected, and with a large sharp knife a layer one-half centimetre thick is cut. From the middle of this piece from two to four oval plates are cut out. In the centre of each plate an opening is cut, the diameter depending upon the calibre of the bowel. The plates are sufficiently firm to prevent sutures from pulling out, and they are elastic and capable of being bent in any direction. If the plates be allowed to remain in water long they become somewhat harder. It is better to keep them for four days in a one per cent. carbolic acid solution before using.

In experimenting upon dogs he found the plates had entirely disappeared at the end of fifteen days.

The author has used these plates in one case of carcinoma of the pylorus and with the best results.

THE OPERATIVE TREATMENT OF DIPHTHERIA IN FURTH FROM 1874 TO 1892.

MAYER (*Therapeutische Monatshefte*, June, 1892) says in the above period three hundred and sixteen tracheotomies and nine intubations have been performed. Of these cases, one hundred and sixty-six were boys and one hundred and thirty-nine girls. In eleven cases the sex could not be determined. One hundred and three cases were cured. All the late operations were tracheotomies, and of these, twelve died. Most of the tracheotomies were high operations, after the method of Rose; thirty-one were low operations. Intubation was done in nine cases. The author thinks that, on account of the difficulty of inserting the tubes and the trouble in the after-treatment, tracheotomy is to be preferred.

CARCINOMA OF THE KIDNEY REMOVED BY LAPAROTOMY.

FRANK (*Internationale Klinische Rundschau*, June 12, 1892) reports the case of a woman, aged sixty-three, who had noticed for a long time a swelling in the right side of the abdomen. On examination, a tumor the size of two fists was found in the right hypogastrium. The tumor had a flat, irregular surface, was hard, and could be pushed above the border of the ribs. As the tumor was so movable, an operation was decided upon. An eighteen-centimetre incision was made in the long axis of the tumor. As soon as the peritoneum was opened the tumor presented in the wound. It could be easily peeled out, the smaller vessels being tied as they bled, so that very little blood was lost. A ligature was applied at the pelvis of the kidney and the whole mass was removed.

Examination of the tumor showed it to be an adeno-carcinoma starting from the lower portion of the kidney. The after-course of the cases was uncomplicated and ended in recovery. The quantity of urine during the first two days was diminished, but then became normal.

This case shows the ease with which a movable but not too large tumor of the kidney can be removed through the peritoneum, especially if the kidney is dislocated downward.

RESECTION OF CARCINOMATOUS PYLORUS.

FRANK also reports a case of resection of the pylorus. A woman, aged 52 years, had been suffering for six months from pain after meals, lasting several hours a day. She was greatly emaciated, and finally, in the evening, began to vomit everything taken into the stomach during the day.

On examination, to the right and above the navel a hard, irregular somewhat movable tumor was found, which possessed all the characteristics of a pyloric cancer.

An opening was made in the median line of the epigastric region. The pylorus was found easily, but was difficult to catch, on account of its movability. The tumor was removed, the stomach wound was made smaller above, and was sutured to the bowel below, and the external wound was closed The case progressed favorably save for the development of a large bed-sore.

At the end of fourteen days the patient was allowed to get up. Six weeks later she developed an abscess in the abdominal wound which was followed by a fistula, from which escaped foul pus, and later masses of fæcal matter. Before leaving the hospital a small tumor could be located to the left of the navel; evidently a growth of the omentum.

The resected section of the stomach measured on the convexed surface eleven and on the concave surface nine centimetres, and had a diameter of six and one-half centimetres. The tumor occupied the pylorus in the shape of a ring to the extent of seven centimetres.

TOTAL SECTION OF THE MEDIAN NERVE TREATED BY SECONDARY SUTURE.

MATTIGRON (*La Médecine Moderne*, 3 année, No. 23) reports a case wounded by broken glass just above the wrist-joint. The median nerve was completely divided, no other injury being inflicted except the skin wound. The moderate bleeding was stopped by perchloride of iron, the wound subsequently healing by granulation. The classical symptoms of nerve-section followed,—anæsthesia, paralysis, causalgia, glossy skin, etc. These were developed about seven weeks after the accident. Land made an incision over the cicatrix, exposing the median nerve at the point of injury. Its upper segment was much swollen, and was attached by fibrous tissue to the skin. The lower segment was normal in size, and on electrical stimulation excited contractions of the hand-muscles, especially of the opponens pollicis. The cicatricial tissue intervening between the two nerve-ends was dissected away, a thin slice of the distal extremity of the proximal portion was resected, and the freshened cross-sections were brought together by direct catgut sutures. Union did not take place by primary intention. In five days there was some return of sensibility. In Tillaux's case of secondary suture, practised four months after injury, sensation returned in ten days. Nicaise reported a restoration of sensibility on the day following operation, and Polaillon five hours after suture of a nerve divided twenty-one months before. In the case reported by Mattigron, sensibility was not entirely restored till a little over a month; the renewal of the function seemed to keep pace with the anatomical restoration of the nerve-fibres. In reported cases a rapid restoration of sensibility is noted, but of sensibility alone. In this case the power of motion was regained at the same time, and the trophic changes disappeared. This is in marked contrast with Segond's case: he sutured the median immediately after it was divided; sensibility was restored in fifteen minutes, but muscular atrophy followed.

HERNIA OF THE BLADDER.

ROTH (*Deutsche Medicinische Wochenschrift*, No. 23) describes several conditions which may predispose to hernia of the bladder.

1. Anatomical changes in the bladder itself and in its neighboring tissues.

2. Conditions of asymmetry, such as the formation of diverticuli.

3. The development of a subserous lipoma, which may enter one of the canals and pull the bladder after it.

The diagnosis is somewhat difficult; as yet no special diagnostic symptom exists. The bladder may be injected with water, and thus an attempt may be made to fill and distend the part forming the hernia, but if the neck of the sack is tight, it is almost impossible to do this without using considerable force.

The author operated on two cases. The first suffered from a swelling in the right inguinal region, which became suddenly painful. A surgeon examined the patient next day, and diagnosticated hernia of the omentum. An incision was made over the tumor, and after considerable careful dissection the sac was reached. On division of the sac, a thin-walled tumor was found, which, on being

opened, allowed a small quantity of fluid to escape. This fluid had a distinctly urinous odor. The bladder was separated from the rest of the contents of the sac, the opening through its walls first having been sutured. The inguinal canal was tamponed with iodoform gauze and the external wound was closed.

The patient entirely recovered.

In the second case the swelling was situated in the right inguinal gland. The operation was not so difficult in this case because of the absence of adhesions.

THE TREATMENT OF BURNS.

VON BARDELEBEN (*Deutsche Medicinische Wochenschrift*, No. 23) states that no specific for the relief of pain of burns has as yet been discovered. The author's present method of treatment is as follows:

After carefully cleaning the burned area, it is irrigated either with a three per cent. carbolic solution or a thirty per cent. salicylic acid solution. Sublimate lotions are avoided because of the great pain they produce.

After all the blebs are opened, the entire surface is covered with powdered bismuth; over this cotton is applied. This absorbs any discharge, and fully protects the burned surface from the air. The cotton may be sprinkled with a powder composed of equal parts of bismuth and starch.

This dressing may be allowed to remain from one to three weeks, according to the case. In cases of burns about the face it is only necessary to cover the burned parts with the powder, the bandage being omitted because of the discomfort it occasions.

Under this treatment the author has seen children recover where two-thirds of the body were involved.

Von Bardeleben thinks the bismuth probably exerts some influence in preventing intestinal complications, as in one hundred cases treated in this manner only two had blood in their stools. In using the bismuth, there is no danger of intoxication from absorption, even in cases where it is extensively applied. By the antiseptic treatment secretion is greatly diminished.

RUPTURE OF THE BLADDER.

RIEDER (*Berliner Klinische Wochenschrift*, No. 24, 1892) reports the case of a man, aged 44, who, while in an intoxicated condition, had fallen down a flight of steps. Immediately he was taken with pain in the region of the bladder, and some blood was discharged from the urethra. He managed to get home himself, and went to bed. He shortly began to have considerable pain, as though his bladder was over full. He was, however, unable to evacuate its contents. Forty-eight hours after the accident the patient began to show signs of collapse. On examination, a large tumor was found extending from the symphysis to the umbilicus, so that it was first thought the patient had a distended bladder. A silver catheter was easily introduced, and five hundred cubic centimetres of blood-stained urine withdrawn. There was, however, no alteration in the size or shape of the tumor. Rupture of the bladder was diagnosticated, and an operation decided upon.

A three-inch median incision was made in the hypogastric region, exposing an extraperitoneal rupture in the anterior wall of the bladder three inches in length.

The rupture was closed by a double row of sutures. The first row united the mucous membrane, the second row the muscular layer and prevesical tissue. Finally, the skin wound was closed, and a catheter was introduced and allowed to remain. At the end of thirty-two days the patient had entirely recovered. The author thinks the present decrease in the mortality of these cases is due to the antiseptic treatment employed. All cases of bladder rupture, whether extra- or intraperitoneal, should be treated by incision in the hypogastric region. Only by this method can the infiltrated urine be drained from the prevesical connective tissue.

THE SURGICAL TREATMENT OF PERITYPHLITIS.

SCHEDE (*Deutsche Medicinische Wochenschrift*, No. 23, 1892) states that in most cases of supposed typhlitis only the appendix is involved, and in cases where considerable exudation exists the appendix is generally found perforated.

Abscess of the appendix may open into the cæcum, the bladder, the small intestines, or even into the peritoneal cavity, setting up rapid fatal peritonitis. The author thinks the abscess should not be operated upon until it is near enough to the skin to cause the parietal and visceral peritoneal layers to be glued together.

If the abscess should become retroperitoneal, it should be opened as soon as diagnosticated, in order to prevent the pus bur-

rowing down into the pelvis or around the kidney. Extirpation of the appendix is difficult and often impossible, and the procedure is always dangerous. Acute perforating appendicitis is the most fatal of the conditions in this region, as it sets up a rapidly fatal septic peritonitis.

In these cases operation must be performed early. Of the three cases operated upon by the author, two died within twenty-four hours, because they were not taken early enough; the other case got well.

In certain cases local peritonitis results from hinderance of the fæcal circulation, either due to paralysis or to a twist.

Differential diagnosis under such circumstances is scarcely possible. In one case the author operated for appendicitis, but found the above condition. In one case, owing to the plastic peritonitis, the peristaltic motion of the bowel was interfered with, so that passage of the intestinal contents was prevented. The symptoms were so slight that very little attention was paid to them. The patient died a few days after the operation.

Occasionally in a case of typhlitis or perityphlitis there are found on the cæcum small purulent nodules. These contain innumerable bacteria, which are, however, all dead.

This condition was responsible for the death of one of the reported cases. Sometimes the symptoms of these conditions are so insidious that they are overlooked. This happened in two cases the author treated. In certain insidious cases, where the condition goes on to the formation of a circumscribed exudate, which is hard or callus-like, then the differential diagnosis from a carcinoma is not possible.

THE TREATMENT OF FRACTURE OF THE CLAVICLE BY A NEW DRESSING.

BUNGNER (*Deutsche Medicinische Wochenschrift*, No. 23, 1892) believes that the Sayre dressing meets the surgical indications of fractured clavicle better than any heretofore described. He believes that the same end can be accomplished by a three-tailed elastic T-bandage.

The cross-piece should be twenty-four inches long, and an inch and a half broad. To the centre of this piece is joined three tails, each forty-four inches long and five inches broad. These are so attached that the middle tail is perpendicular to the cross-piece, while the side tails are fastened somewhat obliquely.

The cross-piece of the T is fastened to the sound shoulder.

The middle band is then seized, and carried over the back through the axilla to the upper part of the arm of the injured side, brought back to starting-point and fastened. By this means the arm is drawn backward. The lower tail is likewise carried over the back, around the injured arm just above the elbow, and back to starting-point and fastened.

This piece not only draws the arm backward, but also somewhat upward.

The last tail goes over the sound shoulder, making a loop to support the hand, back again over the seat of fracture, and is fastened behind to the other two tails.

The advantages of this dressing are:

The thorax is left free.

It need only be applied to the skin during the first ten days, and then can be put on over the clothes.

It is a much more comfortable dressing than either the Velpeau or Desault.

It is always in the same place, no matter what position the patient may assume.

The dressing can be applied in treatment of any fracture of this bone.

GUNSHOT WOUNDS OF THE ABDOMEN CURED BY CŒLIOTOMY AND INTESTINAL SUTURE.

AHERN (*L'Union Médicale du Canada*, June, 1892) reports a case wounded by a 32-calibre revolver fired at a few paces distance, the wound of entrance being placed midway between the umbilicus and the anterior superior spine of the ilium. There was neither shock nor severe abdominal pain. The patient vomited twice in the course of an hour. He was chloroformed immediately, the wound of entrance was examined, and found to be penetrating. An incision from the umbilicus to the pubis was made in the middle line. This showed blood effused into the peritoneal cavity. The original cut was enlarged upward. The wound in the parietal peritoneum was found to be bleeding, and was closed by suture. An examination of the small intestines showed seven perforations. These were all sutured with catgut, as were also three openings in the left portion of the transverse colon. There was no fæcal extravasation. The belly cavity was washed out with hot water; the abdominal wound was drained and closed. The tube was taken out in three days. The

temperature never reached 99°. The patient left the hospital entirely cured in a little short of four weeks.

REMOVAL OF THE UTERINE APPENDAGES FOR HYSTERO-EPILEPSY.

HOLDT (*American Gynæcological Journal*, vol. ii., No. 6) recommends this operation when all other treatment for the relief of epilepsy failed, and patient's condition is gradually becoming worse; when such pathological changes exist in the pelvis that the epileptoid fits must obviously be found to have some connection with such diseased condition. If the operation is contemplated in a case when the appendages are not grossly diseased, the author thinks it necessary that there should be epileptoid fits upon palpation of the ovaries, and that the seizures should be most intense about the menstrual period. If an aura exists it should proceed from the ovarian region.

In his report of six cases all had convulsions for some years, and in all the attacks were increased about the menstrual period. In only one case was an aura present. In one case the results were negative.

TREATMENT OF FIBROUS AND FIBRO-CYSTIC TUMORS OF THE UTERUS BY TOTAL ABLATION.

PEAN (*Annales de Gynécologie et d' Obstetrique*, tome xxxvii., June, 1892) states that he has sufficiently demonstrated the fact that all small tumors of the uterus—that is, those which are not materially larger than the head of a fœtus at term—can be removed almost without danger through the vagina, the uterus being preserved or not according to the indications. For larger tumors it will be necessary to make an abdominal incision. When these growths are subperitoneal and pediculated, exposure by means of a median abdominal incision, freeing of all adhesions, ligation of the pedicle, and section form as safe an operation as that for ovarian cyst. If, *per contra*, the tumor is interstitial, it is necessary to place the ligature so that the body of the uterus and the annexa can be removed. In such cases the neck and a small portion of the body of the womb form the pedicle, which can either be fixed in the lower angle of the abdominal wound, or reduced after having been covered with peritoneum.

The extraperitoneal method, when applicable, has the advantages of being rapid, of not exposing the peritoneal cavity to infection from the section surface, and of permitting the surgeon to provide against hemorrhage and to dress the wound. Moreover, this method has given a larger percentage of successes, and is, therefore, usually the one of choice. Nevertheless, there are certain patients in whom the pedicle thus formed is so broad and short that the extraperitoneal method is not applicable. In such cases Pean has demonstrated that it is better to reduce this pedicle, after having ligated it in two parts, and after having closed the surface of section by means of sutures.

Finally, when the tumor occupies both the body and the neck of the uterus, Pean insists upon total ablation of the organ. In such a case the tumor is exposed by means of an abdominal incision, the broad ligaments on each side are seized with long, strong pressure forceps, and are cut between these forceps; then after section and ligature of these ligaments, a metallic loop is placed beneath the tumor, as near as possible to the neck of the uterus. The latter is divided above the ligature, the bladder and rectum, of course, being dissected free when this is necessary. Nothing else remains to be done but to open the posterior and anterior *cul-de-sac* of the vagina, and to remove the neck of the uterus, after having placed upon the lower portion of the broad ligaments large pressure forceps, the handles of which are allowed to project through the vulva. These suffice for the permanent prevention of hemorrhage. According to the author's most recent researches, this method can be still further simplified. After having opened the abdomen, the tumor is drawn out, and beneath it is placed a ligature of rubber, as near as possible to the neck of the uterus. This ligature is secured by means of strong pressure forceps, and the tumor is cut off at a point a few centimetres beyond the seat of constriction. If there are several tumors, each is removed successively in the same manner. There remains only the neck and the lower portion of the uterus. From these structures the bladder must be separated, all bleeding-points being seized with forceps or secured by ligature. Next, either above or below the rubber ligature, according to the circumstances of each case, a metallic thread is drawn as tightly as possible. It is secured by twisting, and the long ends are cut away. Then as much of the remaining tumor as is safe to remove, without run-

ning the risk of the wire ligature slipping, is cut away. This stump is returned to the peritoneal cavity, and the abdominal wound is closed. The operation is concluded by extirpating through the vagina the remaining portion of the cervix and uterus.

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*LAPAROTOMY IN TUBERCULAR PERITONITIS OF CHILDREN.

HARTMANN and ALDIBERT (*Annales de Gynécologie et d'Obstetrique*, tome xxxvii., June, 1892) state that laparotomy in cases of tubercular peritonitis of children was first practised on account of error in diagnosis. Petri first performed this operation on a girl of 14, whom he believed to be suffering from cyst of the ovary. In spite of the return of the effusion the following year, and of bony and glandular lesions, the patient remained cured twelve years later.

Dorhn operated on a child aged 4 for supposed cyst of the ovary, and found diffuse tubercular peritonitis. The patient was cured, and remained so a year later. Roosenberg reported a case two years after operation, the results being highly satisfactory. This was in 1887. Since then many operations have been performed, forty-eight of which have been collected by the authors. Three of these cases occurred in their own practice. In two they established by inoculations the bacillary nature of the effusion.

The first case, a boy of 12 years old, suffered from night-sweats, loss of appetite, dyspeptic symptoms, abdominal pains, and diarrhœa. There was marked tympany. In two months from the beginning of the symptoms his trouble was well advanced, ascites was very evident, frequent vomiting developed, pains became most severe, and the temperature presented marked fluctuations. As medical treatment brought no relief, and death was threatened, abdominal section was performed. Universal adhesions were found, but no fluid was evacuated. The comparatively small portion of the abdominal cavity exposed by incision was washed out with warm boric acid solution, and the abdominal wound closed without drainage. As the result of this operation, the symptoms disappeared, the ascites could no longer be found, and the abdomen returned to its normal condition. A year later it was reported in this case that neither ascites nor any points of induration could be felt about the belly. The peritonitis was apparently cured, but the child had wasted. The only post-operative complication was a tubercular ulceration of the cicatrix.

The second case observed by the authors was a tubercular, suppurating, encysted peritonitis, occurring in a child of 9 years. The pus-cavity was opened, evacuated, irrigated with sterilized boric acid solution, and drained. This case was peculiar, from the fact that the onset of the disease was comparatively sudden, and dated from an injury. The tubercular nature of the discharge, however, was proven by inoculations. There escaped from the pus cavity not only the products of ordinary suppuration, but bowel contents suggesting that possibly in this case there was a latent peritonitis which had been rendered acute by rupture of a diseased intestinal coil. When the child was operated upon she was wasted to a skeleton, was suffering from a high fever, experienced most violent pains, and could scarcely take any nourishment. Eight months after operation she was strong and fat; was without pain; the abdominal surface was perfectly normal in appearance and feeling; the child indulged in all recreations with her comrades. The probable intestinal communication into the cavity of the abscess closed spontaneously.

The third case was 6 years of age; the classical symptoms of tubercular peritonitis were manifest. On abdominal incision no tubercular granulations were found. There was a very small quantity of ascitic fluid and many large mesenteric glands. It is perfectly possible that there may have been tubercular involvement in other parts of the abdomen, while the hypogastric region alone was explored. As the result of what was in this case a purely exploratory incision, excepting from the fact that irrigation with boric acid solution was made, there was great improvement in the child's condition. Pain was lessened, the child was able to leave her bed, and appeared almost completely restored to health. The authors have tabulated forty-eight cases of laparotomy performed upon children suffering from tubercular peritonitis; forty-six were cured and two died. A certain number of those counted as cured were not subsequently observed.

Of the total number of cases, bacteriological and histological examinations, proving the tuberculous nature of the disease, were made in eighteen. All of these recovered from the operation. Six were reported as definitely cured,—two after one year, three after a year and a half, and one two years after operation.

The authors state that laparotomy, under proper conditions, is destined to cure many children suffering from tubercular peritonitis, but that all cases should not be subjected to this operation, intervention being indicated only when the peritoneal lesions are the principal ones from which the patient is suffering. Fever and cachexia, when they are due to a diseased condition of the peritoneum, strongly indicate operation.

THE CURE OF VESICO-VAGINAL FISTULA BY OPERATION THROUGH THE BLADDER.

TRENDELENBURG (*Deutsche Medicinische Wochenschrift*, June 8, 1892) reports the results of the operation upon two cases. The first case was the result of a forceps delivery. High up in the anterior vaginal vault an oval opening, about the size of a pea, was found.

The patient was prepared for operation, and a ten-centimetre transverse incision, through skin, fascia, and recti muscles was made above the symphysis. A transverse incision was then made in the bladder below the edge of the peritoneal fold. The incision was prolonged a little to the left, in order to better expose the fistulous opening. The upper edge of the bladder incision was then temporarily sutured to the upper edge of the skin incision. For safety a catheter was introduced into the urethra, and two fine sounds were passed into the ureters. The fistula was then found to be between the mouths of the ureters and somewhat to the left of the median line. Its borders were freshened by two curved, funnel-shaped incisions. To bring the fresh surfaces together in the line of the ureters, the silk sutures were so introduced that the knots were made to appear in the vagina. Then six fine catgut sutures were passed through the freshened surfaces and knotted in the bladder. The bladder was washed out with a weak sublimate solution; and, leaving an opening for a T-shaped drainage-tube, was closed by a double row of catgut sutures, after the method of Lembert. Small iodoform gauze tampons were placed in the prevesical space, and the skin wound was closed, leaving a middle opening for the drainage-tube, and one at each corner of the incision for the tampons. This patient made a complete cure in one month.

The second case was also due to a forceps delivery. The urine began flowing through the vagina soon after the child was delivered. In the right vaginal vault a fistula was found about as large as a bean. At the operation the same transverse incision was made, but a portion of the symphysis was cut away, its fascial attachments alone not being divided. After placing the patient in such a position as to elevate the pelvis, the anterior wall of the bladder could be exposed sufficiently to allow a large transverse incision to be made. The fistula was found situated at a point one and a half centimetres above and to the outer side of the opening of the right ureter. By passing a fine sound into the right ureter, the point appeared in the fistula, and then could be made to enter the ureter again. The difficulty here lay not so much in closing the fistula, as in accomplishing this without occluding the ureter. The ureter was first separated from the fistula for three-fourths of a centimetre; then working from before backward, the opening was freshened and closed with five catgut bladder sutures. In order to keep the mouth of the ureter clear, a fine fish-bone bougie was introduced, and the other end brought out through the urethra.

The bladder wound was closed, as in the previous operation. Instead of the T-tube, a simple drainage-tube was used. The osteotomy wound was sutured with wire, the iodoform tampons being brought out at the corners of the wound. This case also recovered. The author thinks considerable care must be taken that urine does not escape around the tube into the prevesical space. This can be prevented by stretching the bladder wound laterally before suturing, so that when freed it tightly surrounds the tube by virtue of its elasticity. The contractility of the bladder is not materially interfered with by transverse section.

THE OPERATIVE TREATMENT OF SPINA BIFIDA.

In *La France Médicale*, 39 année, No. 21, 1892, a further contribution is offered by PERRIER upon the subsequent course of a case of spina bifida operated upon by Berget. It will be rembered that Berget's method consists in filling up the space left by the congenital absence of the vertebral laminæ by means of bone grafts taken from live animals. By this procedure the shock is limited to a minimum and the spinal cord is not encroached upon.

The patient, aged 7 weeks at the time of

operation, is now, five months later, entirely cured. The cicatrix is smooth and solid. It presents the consistency of dense fibrous tissue, rather than that of bone, and if the transplanted osseous tissue has been absorbed, it will at least serve as a substratum of tissue so dense that it may ossify later.

Reviews.

A System of Practical Therapeutics. Edited by Hobart Amory Hare, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia, assisted by Walter Chrystie, M.D. Vol. III. Diseases of Skin, Diseases of Nervous System, Diseases of Genito-Urinary Apparatus, Diseases of Eye, Diseases of Ear. With illustrations.
Philadelphia: Lea Brothers & Co., 1892.

Vol. III. of this very interesting series will cause a still more profound shock to the medical fossil who has survived its two predecessors. What! a system of therapeutics devoted not alone to well-ordered diseases, like small-pox and pneumonia, but to gonorrhœa, to diseases of the testicle, diseases of the vagina, uterus, and ovaries, whose pages are filled with excellent wood-cuts, descriptive of gynæcologic operations, a book in which we can find how to treat the puerperal diseases, and diseases of the eye and ear! But these innovations add unmeasurably to the value of the system, giving it a so much larger scope, wider field, and so many more interested and rewarded auditors.

The group of articles on "Diseases of the Skin" is by H. Radcliffe Crocker, M.D., F.R.C.P., James Nevin Hyde, M.D., and Milton B. Hartzell, A.M., M.D., and give us a complete manual for the treatment of skin-diseases.

"The Diseases of the Nervous System" are represented by twelve articles, each of which really deserves as careful notice as any monograph appearing from a noted writer. "Hospital Treatment of Insanity," by Edward N. Brush, M.D., and the "Medical Treatment of Insanity," by H. M. Bannister, M.D., give us an insight into the technique of the lunatic asylum, and whatever secrets of the charnel-house there be are here revealed. Much of this kind of work has in the past failed to find an exponent in general medical literature, and asylums have seemed too often close corporations, wherein the very walls have seemed of necessity to enclose something that the medical world ought to know and did not. The article by Dr. Brush goes thoroughly into the legal points involved in the commitment of lunatics to asylums, and the varying laws of different countries and the various States of our own land, things which need to be better understood before one can hope for better laws.

"Chorea," is by B. Sachs, M.D. "Epilepsy and Tetanus," by Dr. J. Chalmers Da Costa. "The pathology of epilepsy," the author says, "as taught to-day, is a high probability, but, unfortunately, not an established certainty." Notwithstanding which melancholy state of things, the epileptic, in the hands of the experienced physician, fares by no means worse than the sufferer from other chronic diseases. What we lack in accurate pathology, by happy accident we make up somewhat in intelligent empiricism. Dr. Da Costa has given a very careful study of the treatment, and has not forgotten the new remedies,—antipyrin and phenacetin. The chapter on "Tetanus" is especially to be commended for its conciseness and good sense.

"Locomotor Ataxia, Acute Infantile Spinal Paralysis, Myelitis, and Amyotrophic Lateral Paralysis" is by M. Allan Starr, M.D., Ph.D. "Apoplexy, Brain Tumor, Spinal Tumor, Meningitis, Cerebritis, and Neuritis" is by Dr. Chas. K. Mills. The most valuable portions of the article will be found under "Meningitis" and "Neuritis." The latter section is thoroughly devoted to therapeutics, though a few pages on "Symptomatology" are a valuable addition to its usefulness.

A very interesting article is that on "Disorders of Sleep," by Landon Carter Gray, M.D.,—a very excellent title for a very valuable paper. At the beginning we are told that "we must look squarely in the face the unwelcome fact that sleep and its derangements must be studied from a purely clinical, and therefore somewhat empirical, point of view." Of remedies, the author considers chloral the best, but uses it rarely. Sulphonal, combined with bromides, next best, and uses frequently. Insomnia, caused by pain and local disease, is studied case by case. Here we are to use one remedy, there another, and why? This is an exceedingly practical way of teaching; it is more definite than any other way. Many extremely valuable diagnostic hints are given, as, for instance, between the insomnia of neurasthenia and that of melancholia.

Night terrors the author allies with som-

nambulism. In this section we are at a loss to understand the author, where he advises circumcision for night terror. Though the effects of the operation be only temporary, yet in a functional nervous disorder it is often sufficient to effect a cure; and he adds, "It may even be done with benefit in cases in which there is phimosis or redundant prepuce," as if any other case were so suitable, and as if surgeons generally picked out cases where the foreskin was already retracted and too scanty.

Dr. Wharton Sinkler has written a real monograph on "Headaches and Neuralgia," the former a subject at which many able men have tried their hand with indifferent results, so far as giving much relief goes. Much will be learned by the reader, however, from this article by reason of the simplicity of its arrangement and the thoroughness of his work, combined with his great practical experience. In fact, the subject of the treatment of headaches, unlike many other medical questions, has tended of late years to become more simple and to run in broader lines, thanks mainly to the oculist and the chemist. It is possible now to relieve a permanent headache, and to stop the paroxysms of a periodical one with some certainty. Dr. Sinkler's table of remedies, and the cases to which they are each specially adapted, should be often referred to, for it is probably the best at present extant.

"Nervous Disorders and Paralyses from Excessive Use of the Parts affected, Vertigo, Tremor, and Lead-Poisoning" is by C. Eugene Riggs, A.M., M.D., "Cerebral Concussion and Shock" by Joseph Ranshoff, M.D., F.R.C.S. (Eng.), and form two exceedingly able articles. In the former is given a very extended study of the special trades and employments, and the method in which they overstrain certain parts by excessive use. The new disorders which are forcing themselves into notice, as we use new machinery and employ electricity everywhere, like the disease which overtakes the constant users of the telegraph and telephone, are especially considered. Under "Vertigo" the author gives methods of treatment which we feel sure will be complete novelties to most readers.

The paper on "Shock" deals with railroad and other injuries, dips into medical and legal questions alike, and gives us very clear ideas upon a very badly understood class of cases, over which, we are sorry to say, opinions are very apt to be antagonistic, especially when they come to trial.

"Morbid Habits," by T. D. Crothers, M.D., embraces the alcohol, opium, cocaine, and chloral habits, and is written as a standard article should be,—strictly from a medical point of view, uninfluenced by the senseless clamor of fanatics. The author prefers the term "inebriety" to "alcoholism," because it indicates a general condition, and not a particular or special cause.

The author believes that "the moderate drinker of the past is disappearing, and in his place comes the impulsive maniacal drinker." This sudden increase of a dangerous class of cases, in recent years, if it be true, calls for some reflection. If it be true, for what proof have we that there are relatively more maniacal drinkers than one hundred years ago. The "three-and-four-bottle men" of the past century drank to stupor, and drank habitually; how many of them succumbed to "acute organic affections" and "complex brain and nerve degenerations" we can hardly estimate to-day, but their number must have been great to cause the rise of that wave of temperance that has swept over the intelligent and educated world, that found the British aristocracy a mob of drunkards, and left them "the most sober and temperate aristocracy on earth."

The author endeavors in his article to be of use to us in a class of cases which always give excessive trouble and cause endless anxiety in their management. Starting with the axiom that "inebriety is a disease," he advises us to study our cases and their past history more closely, and lays down the lines to be followed in such study. "The physician," he tells us, "should never sustain a moral theory of causation, or consent to the patient assuming all the obligations of a healthy man." Rest, restraint, treatment, these are the things we demand in treating our cases, and these the law refuses to give us. The liberty of the individual may be curtailed in every other way. He may be surrounded with a thousand legal annoyances, and also fail by law to be protected from as many attacks and dangers, but to step in and protect him from himself, to save his family from loss of fortune, himself from destroying even his own life, this is illegal, and the physician asks in vain for such authority.

Concerning a very marked and large class of inebriates, who are the subjects of unsuspected nerve degeneration, and who manifest it at times by criminal acts, the author says

(page 482) that, when committed to prison, "less than *two* per cent. ever recover after the first commitment to jail." For these hospital treatment is absolutely demanded.

Of "periodical inebriates" he remarks, "A large proportion of these cases will have parents who are insane, epileptic, or moderate or excessive drinkers." This covers almost everybody. For the parents who were neither moderate nor excessive drinkers must have been total abstainers, and they were in large proportion the children in turn of excessive drinkers. Had the author added "consumptives" to his list of progenitors for the periodical inebriate, he would have done better.

In treatment the author's advice is judicious. Meat should be used sparingly; vegetables and fruit freely. The strain of business and its manifold anxieties totally removed; hygienic surroundings. "Medicinally, the return of the drink-craze may be averted or partially neutralized by the free use of bromides a day or more before. Strychnine (gr. $\frac{1}{40}$) is also very valuable every four hours before the paroxysm comes on. Free purgation with salines, and large (100 gr.) doses of bromide of sodium every four hours. Usually the patient recovers without any further medication." Where excesses in eating provoke the paroxysm, "the practical remedy is a calomel purge." We believe by experience that the author's method in these cases is valuable and scientific. Whether we are justified under certain circumstances in turning or "switching off" such cases into the opium habit is one of the problems discussed.

Many of these cases spontaneously recover. Religious revivals, pledges, moral shocks cure a certain percentage. The author notices the rapidly-increasing number "whose drinking dates from some state of nerve and brain exhaustion." Mere abstention cannot cure these. They, as well as the preceding classes, demand long and careful treatment.

"The dipsomaniac is only an exaggerated type of the periodical drinker, in whom the drink-storms become manias." Here sanitariums and private asylums fail by reason "of the association with other cases." "The dampness and low pressure of the sea-level have provoked the drink impulse in many cases." High, mountainous regions have the same effect on others. The opium, chloral, and cocaine habits receive the same careful study from the author, whose pages are filled with wise observations and valuable advice. We confess to having been much interested in the whole article.

Dr. Andrew H. Smith gives an excellent and well-illustrated article on "Nephritis, Pyelitis," etc.

"Gonorrhœa and its Complications, Stricture, Cystitis, Hypertrophy of the Prostate, Atony of the Bladder and Vesical Calculus" is the title of Dr. J. William White's contribution to the "System of Therapeutics." Like all articles emanating from this writer, it is deserving of careful study, and gives us in its best form the most recent methods of practice and treatment on the part of an experienced specialist. The article, as a whole, is exceedingly practical, in the sense understood by the average medical reader. Dr. White leaves little or nothing to be invented or imagined. Were the nascent practitioner, treating his first case of gonorrhœa, to rely exactly upon this article, say to his patient, by way of advice, no more than it says, do for his relief what it tells him to do, the case will be well managed. He is told what to do on the first visit, what to do on the second stage, and so on. While the whole article may be termed a short one in contrast to many in the book, the entire field is well covered.

"Diseases of the Prepuce, Glans Penis, and Testicles," by Edward Martin, M.D., is a very excellent article, dealing in a portion of its pages with the obscure and generally bemuddled subjects of impotence and spermatorrhœa. Throughout it strikes the happy line between prudish reticence and outspoken vulgarity, the Scilla and Charybdis of almost every writer on the subject. In this article one can learn what to really do for these cases, which are the bane of every respectable practitioner, and the staff and water of life to the charlatan and quack.

Dr. T. J. Watkins writes on "Diseases of Vulva, Vagina, and Non-venereal Leucorrhœa."

The article, "Diseases of the Uterus," by R. L. Dickinson, M.D., contains, among many other valuable things, a short but excellent dissertation upon feminine dress—and the corset, that ingenious invention of past generations, that now stands like a wall of steel—which it is—between woman and the realization of her highest aspirations. The success of the woman's movement depends today upon the question of the retention of the corset. The work of the world will never be done by a laced-up army of workers. This study of the corset is scien-

tific and pitiless. It is so illustrated as to make the reader short of breath as he looks at the pictures and diagrams. Some of the illustrations farther on, concerning muscular exercise, are extremely unique, and we meet, as we proceed (on page 744), a kind of picture which is a novelty, and which seems calculated to provoke mirth. A more remarkable series of illustrations, however, appear in the section on "Uterine Massage" (page 775), which are to be commended at the very least for ingenuity.

"Amenorrhœa, Dysmenorrhœa, Menorrhagia, and Sterility" is by Dr. Hunter Robb; and "Diseases of the Broad Ligaments, Tubes, and Ovaries" by Howard A. Kelly, M.D. These articles will be found to be written purposely with the therapeutic motive, and will be all the more useful on that account. They also abound in good illustrations, which enhance their value.

Dr. Barton Cooke Hirst is the author of "Diseases of Pregnancy, Parturition, and of the Puerperum, Extrauterine Pregnancy, and Abortion," and has confined himself closely to the therapeutics involved in the subject. The therapeutics of abortion are to be especially noted as giving valuable points, and forcibly advocating a rational method of procedure.

The eye articles are nine in number, on "General Considerations of the Treatment of the Eye and its Disorders," by W. F. Mittendorf, M.D.

"Diseases of the Conjunctiva, Sclera, and Cornea," by Geo. E. de Schweinitz, M.D.; of the "Iris and Ciliary Body, Sympathetic Affections," by Chas. J. Kipp, M.D.; of the "Optic Nerve, Retina, Choroid, and Vitreous, Amblyopia and Amaurosis," by S. C. Ayres, M.D.; of the "Lens and Glaucoma," by Swan M. Burnett, M.D.; of the "Orbit, Lachrymal Apparatus, and Eyelids," by Henry Gradle, M.D.; of the "Ocular Muscles, Paralysis, and Concomitant Squint, Asthenopia, Spasms of the Ocular Muscles, and Nystagmus," by Lucien Howe, M.D., F.R.C.S. (Eng.); "Optical Therapeutics, Normal and Abnormal Refraction, Presbyopia, Principles involved in fitting Glasses," by Edward Jackson, M.D.; and "Injuries of the Eye and its Appendages," by F. Buller, M.D., are articles covering the pages from 874 to 1204, and form as complete a treatise on the therapeutics—medical and operative—of the eye as can well be imagined, the names of the writers being quite sufficient warrant for the value of their work.

The volume closes with articles on "Diseases of the External Ear and Tympanic Membrane," by B. Alexander Randall, M.D.; "Acute Diseases of the Middle Ear," by Robert Barclay, A.M., M.D.; "Chronic Catarrh of the Middle Ear and Diseases of the Internal Ear," by Chas. H. Burnett, A.M., M.D.; and "Chronic Purulent Disease of the Middle Ear," by Samuel Sexton, M.D. This group of articles rivals in what it does for the ear the preceding group on the eye, and fitly concludes this unique work on therapeutics,—a work whose method grows upon the reader, and commends itself to him more and more as he turns its pages. We are all tired of the old ruts, and to the student, reading book after book, the system comes like a breath from the sea to the weary toiler of the city. E. W. W.

THE POCKET PHARMACY, WITH THERAPEUTIC INDEX. A RÉSUMÉ OF THE CLINICAL APPLICATION OF REMEDIES ADAPTED TO THE POCKET-CASE FOR THE TREATMENT OF EMERGENCIES AND ACUTE DISEASES. By John Aulde, M.D., etc.
New York: D. Appleton & Co., 1892.

It is one of the interesting and endearing traits of our English tongue that the same word has often to do double or treble duty. Thus while it may create at times some little confusion, at others it lends itself to a pleasing excitation of the fancy, that property of the mind which may be described as the broth of imagination.

"The Pocket Pharmacy!" how near to its realization have we come with our triturates and granules, our concentrated extracts and active principles! Thanks to the science and labor of the manufacturing chemist, it is now possible for even the humblest and poorest member of our noble calling to be a homœopathic practitioner, in outward appearance at least, at comparatively little expense.

But lest the enterprising young medicus, already armed with his pocket pharmacy, constituting in himself, so to say, the august *pharmacien* and his humble assistant, as well as the well-ordered drug-store, with its brimming jars and bottles, its soda-water fountain and syrups, might feel embarrassed in managing his plant, and be somewhat clumsy in dispensing, our author has written him a guide, so that now, as he wends his weary way through tramwayed streets and alleys, he may consult, furtively or boldly, as his temperament may be, the "Pocket Pharmacy, with Therapeutic Index," by Dr. John Aulde. For this book is written to tell him how to

manage "remedies adapted to the pocket-case." For all remedies are not "adapted to the pocket-case." Croton oil is not, nor is salts and senna, nor many a quaint and curious relic of forgotten medical lore. Twenty-four remedies out of the vulgar many are alone considered worthy and capable of such adaptation. Some might object to such a limited pharmacy; but, guided by the book, all likely emergencies will be met, and with acetanilide and aconite, alterative pill, and arsenic sulphid., atrop. sulph., and bryonia alba, with the eighteen others, the ills of humanity, terror stricken, will flee in a disorderly and demoralized throng before the stately advance of the pocket *pharmacien*. We see him now, with head erect, nostrils slightly dilated, lips firmly set, one hand fixed on the "Pocket Pharmacy," to keep it from jingling, the other holding Dr. Aulde's "Pocket Pharmarcy," his eyes fixed upon its pages, a noble picture of the advanced guard of the army of the future. Truly, as Dr. Aulde remarks, "intellectually rich," yet "technically poor," how frequently is this the case to-day; but in the golden future, when the profits of the miserly *pharmacien* are combined with the honorarium of the physician, then, indeed, will the physician rival and displace the robber baron of his time, combine in himself the good Samaritan and the thieves, take his twopence, not out of his own pocket, for that is filled with the "Pocket Pharmacy," but from the well-filled purse of his victim. No oil and wine will he pour into him, for they are too bulky for the "Pocket Pharmacy;" but better drugs he has, which will speedily reduce him.

The remedies being few, Dr. Aulde has been obliged to fit them carefully to the diseases, and stretch them somewhat to make them go round. It seems also that the diseases have to be fitted at times to the remedy. The emergency of aphthous sore mouth is met by biniodide of mercury, as are also bunions and biliary calculi, which begin with B. Cerebral anæmia and cerebral congestion are both stretched to meet this remarkable drug. Chilblains and chancre yield at once. Diarrhœa, dyspepsia, and elephantiasis, endocarditis, glanders, and gonorrhœa likewise; and in the awful emergency of muscæ volitantes it rises right up to the needs of the hour. Gleet, too, must be an emergency, for it is not an acute disease, and there is no other alternative. Seborrhœa, for which calcium sulphide is recommended, is a very acute affair, and so is chordee, for which aconite is used. Each remedy has an alphabetical list of diseases appended for which it is valuable. We see, in looking through the pages, that each remedy hits almost all the list, and find uses for these drugs which are to us quite novel. Nor do we dispute that they can be given, but are they useful, and, if so, are they the best and most likely to succeed? Would one trust sunstroke to quinine hydrochlorate, or pneumonia or typhoid fever to the same drug, or arsenite of strychnine in post-partum hemorrhage. Take one disease from the alphabetical list under each remedy, and let us see what Dr. Aulde's armamentarium is. Angina pectoris, for instance, begins with A, and for it we have acetanilide compound, aconite, arsenic sulphide, muriate of quinine, arsenite of strychnine, trinitrin.

Cystitis gives us aconite, bryonia, quinine muriate, rhus tox. Where, we ask, are atropine, morphine, the benzoates, the balsams, the alkalies, and many more vitally necessary remedies. If the emergency or acute disease consist in deafness, we are relegated to calcium sulphide and quinine alone. If one be choking, his despairing eye will light on only atropine sulphate, and give up in despair.

The case of delirium tremens, which is generally a real emergency, must swallow atropine, cannabis indica, arsenite of copper, gelsemium, morphine, and tartar emetic, arsenite of strychnine and quinine hydrochlorate, or die. If he have hepatic colic, his whole hope rests upon atropine sulphate; or, if his colic be intestinal, alterative pill, atropine, bryonia, camphor, arsenite of copper, morphine, strych. arsenite are offered, singly or all of them, and he has some chance. If your doctor is a pocket *pharmacien*, it is better to have intestinal colic. The victims of "fever" have a long list to choose from, but fissure of the anus must be treated by calomel alone. Headache has some chance, but that desperate emergency, or acute disease, "lactation," has to fall back on atropine only. Typhlitis, the author thinks, should be met by operation, for he gives us only calcium sulphide.

In fact, the idea of the "Pocket Pharmacy" is good, but the execution of it seems to us defective. Like the parable of "The Princess and the Pessary," the whole affair seems suggested by the alphabet. Still one may improve in time on Dr. Aulde's lines, and arrive at something. Perhaps even a pocket *pharmacien* may be some day evolved from an acute mind,—a sort of automatic toy, which will dispense accurately the reme-

dies of the "Pharmacy," and, like it, can be carried in the pockets of feeble-minded practitioners.

E. W. W.

PYE'S SURGICAL HANDICRAFT. Revised and edited by T. H. R. Crowle, F.R.C.S. First American from the third London edition.
New York: E. B. Treat, 1892.

This book has for some years been the standard work used by dressers and residents attached to English hospitals, and, though it has never attained any very large sale in this country, it has, perhaps, been as popular as any work of its class written by an English surgeon. It is somewhat larger and more comprehensive than the admirable hand-book written by Caird and Cathcart. Perhaps for these reasons it may be less popular with the American student.

Mr. Crowle has evidently tried to bring the work thoroughly up to modern practices, and in the main he has been successful. In the chapter on the preparation of catgut ligatures, but two methods are alluded to. In one it is stated that the gut is prepared by soaking it in carbolic acid and olive oil, in the proportion of 1 to 5, with a little water, for some months. In the other, chromicized gut is made by steeping in a solution of 1 part of pure carbolic acid to 20 parts of a 1 to 4000 solution of chromic acid. It is to be doubted whether any surgeons now prepare gut in this way.

Thiersch's method of skin transplantation is alluded to in such general terms that no one could possibly perform the operation from the description. Chloroform, the author states, is to be preferred to ether in operations about the mouth or nose, in setting of fractures, and in ligaturing of large arteries.

A method of tying in a catheter is pictured and described, which, if employed by an American resident, would almost certainly cause unpleasant words on the part of his chief.

Many omissions and some few misstatements might be quoted, but if allusion were made to these, only the reviewer would be unjust to the book, since in the main it is thoroughly reliable, covers the principal points intended by its author, is clearly expressed, is excellently illustrated, and is a useful addition to the surgeon's library.

An appendix is added, containing formulæ frequently required in surgical practice. As a general criticism, the book may be said to lack the snap which the American reader, and particularly the American student, for whom such works are compiled, particularly loves.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES. Edited by Charles H. Sajous, M.D., and seventy associate editors, assisted by over two hundred corresponding editors, collaborators, and correspondents. Illustrated with chromo-lithographs, engravings, and maps.
Philadelphia, New York, Chicago, and London: F. A. Davis & Co., 1892.

The "Annual of the Universal Medical Sciences" has in former years received the fullest possible measure of praise. The present series, made up of five volumes, is even better than its predecessors. With very few exceptions the editors in charge of the various departments have culled the field of progress, as can be done only by one thoroughly versed in each particular subject.

In the first volume, Whittaker's synopsis of "Diseases of the Lungs and Pleura;" Whittier's review of the "Heart and Blood-Vessels;" Allen Smith's summary on "Diabetes Mellitus and Diseases of the Kidneys, Bladder, and Suprarenal Capsules, and Urinalysis" are especially worthy of notice.

In the second volume, Gray, on "Diseases of the Brain;" Knapp, on "Peripheral Nervous Diseases, Muscular Dystrophies, and General Neuroses;" Montgomery, on "Diseases of Ovaries and Tubes;" and Baldy and Dorland, on "Diseases of the External Genitals and Vagina," would perhaps take the honors.

In the third volume, the articles by Packard, on "Surgery of the Spine;" by White, on "Surgery of the Abdomen;" by Keyes and Fuller, on "Diseases of the Genito-Urinary Apparatus in the Male;" by White, on "Syphilis;" by Conner and Freeman, on "Amputations, Excisions, Plastic Surgery, and Diseases of the Bones and Joints; by Matas, on "Aural and Facial Surgery," are especially to be commended.

The fourth volume contains Oliver's *résumé*, which, as usual, is a masterly exhibition of the advances in "Ophthalmology;" Van Harlingen has thoroughly reviewed the subject of "Diseases of the Skin;" Turnbull and Bliss have well covered the field of "Otology;" Sajous, in the space of thirty-two pages, has presented a most valuable retrospect of the year's work, in "Diseases of the Nose and Accessory Cavities;" J. Solis-Cohen has written an admirable review of "Diseases of the Larynx," etc.; and Ernst and Jackson have contributed a scholarly *résumé* of the work in "Bacteriology;" and Gihon, on "Medical Demography." The articles by Cooper and Clark, upon "Diseases of the Thyroid Gland;" by O'Dwyer, on "Intubation of the Larynx;" and by Birdsall, on

"Inebriety, Morphinism, and Kindred Diseases," also deserve special notice.

The fifth volume contains a most thorough review of "Therapeutics," by Griffith, Cattell, and Cerna; an admirable article on "Experimental Therapeutics," by Hare and Cerna; a section on "Balneology, Climatology, and Hydrotherapy," by Baruch; an exhaustive article upon "Hygiene," by Wyman, and a careful summary of "Anatomical Progress," by Young. This volume is ended by a thoroughly satisfactory section on "Physiology," by Howell.

Of course, among the many articles published, each specialist will find omissions, but the purpose of the work is to collect the most important points presented during the year, and not to entirely cover the annual literature of each subject. Each editor exercises his individual right of selection, and it seems to the reviewer with almost unvarying good judgment. There can be no words but those of praise for this splendid work. It is an educator of the entire profession. To the practitioner who is settled far from great libraries, whose journal list comprises but two or three of the weeklies or monthlies, these volumes should be of incalculable value. From the vast mass of medical literature, much of it chaff, the grain has been picked by experts in each department. By means of the admirable index, in a few moments the latest thought, the latest work, is laid before the physician. He is kept abreast of the times, as was only possible before the appearance of this work to those who were masters of several languages and who had access to many journals. The "Annual" deserves an enormous circulation. Its possession indicates the progressive spirit which in America, at least, is generally essential to success.

PHYSICIAN'S LEISURE LIBRARY. CANCER AND ITS TREATMENT. By Daniel Lewis, A.M., M.D.
Detroit: George S. Davis, 1892.

This little book makes no pretence to going carefully into the classification and pathology of the various forms of cancerous disease. It represents the results of the author's exceptionally wide experience in the New York Skin and Cancer Hospital. It is essentially practical, and though it will perhaps disappoint those who expect the records of brilliant results from the employment of the newer remedies, to the surgeon who wishes a thoughtful estimate as to the value of medicaments which have recently been brought forward as almost specific in cancerous diseases, the conclusions of Dr. Lewis will prove of great value.

In all he has treated five hundred and thirty-four cases. These he classifies carefully in regard to the clinical features. He states that the sense of touch when educated by experience is the almost infallible diagnostician of cancer, and that a man may discard almost every other means, and yet correctly diagnosticate cancer with his index-finger ninety-nine times out of a hundred. It is more unerring than the microscope. He also states that non-malignant neoplasms of the breast represent so frequently the precancerous stage of the disease that a positive diagnosis should not be insisted upon before deciding to remove the growth. Both these statements are undoubtedly in accord with the opinions of those who have had large experience with this class of cases. He does not reject caustics in the treatment of superficial cancer; on the contrary, he has many permanent cures to record.

He prefers to all other cauterants Bougard's paste, from the fact that it forms a dry and friable slough, and can be safely applied to a large surface, can always be prepared and ready for instant use, and in a covered jar will keep for many months.

This book is to be commended as expressing the opinions and practices of one who has had special opportunities for studying the disease which he discusses.

A TREATISE ON DISEASES OF WOMEN. By Alexander J. C. SKEENE, M.D. Second edition. Revised and enlarged.
New York: D. Appleton & Co., 1892.

The second edition of this admirable work has been enlarged by considerable new matter, by a large number of excellent illustrations, and by due attention to the really valuable advances made in gynæcology since the appearance of the first volume. The author is particularly happy in his clear, forcible manner of writing. He has, moreover, treated the subjects upon which he has written in an exhaustive manner. As an added attraction to this book, illustrative cases are appended. These are in the main well chosen, as given in the text, they are of distinct advantage, serving as practical illustrations of the preceding didactic teaching.

The portions of the book devoted to anatomy are particularly satisfactory, and the illustrations of all this part of the work are especially well chosen. In many cases the author gives his own methods and prefer-

ences rather than those in common use. In others he indicates methods of treatment, without expressing opinion either for or against their value. In a text-book the commonly-accepted treatments should always receive mention, and the reader should be guided by the author's experience and judgment in his selection of the newer methods.

Perhaps the least satisfactory portion of the whole book lies in the indications for operation and the description of the operative technique. It is often hurried over in a manner most unsatisfactory to the student, who would seek in this work a safe guide for the performance of all gynæcological operations.

The diseases of the bladder and urethra and their treatment form a section which is particularly praiseworthy. The work closes with a carefully-considered chapter upon gynæcology as related to insanity in women.

This work is one which is easily read, is easily remembered, is sound and scientific in its teachings, is admirably illustrated, and is calculated to be of great value to the student or practitioner of gynæcology. It is open to one or two criticisms, which are, perhaps, of minor importance. The teaching is not always clear and positive. In some cases relation has been lost,—that is, the consideration given to various subjects is not always in proportion to their relative importance. The success the book has met has been well merited, and will, the reviewer hopes, be an earnest of the larger success of this revised, enlarged, and improved edition.

A System of Gynæcology, based upon a Translation from the French of Samuel Pozzi, M.D. Revised by Curtis M. Beebe, M.D.
New York: J. B. Flint & Co.

We have already published in the Therapeutic Gazette a review of the two volumes of Pozzi's "Gynæcology," as published by William Wood & Co. In as far as we can see, this is but a cheaper edition, which lacks the valuable annotations made by Dr. Wells, of New York, in the edition just named. While the illustrations in the edition of Dr. Wells are remarkably clear and well executed, those with which this book teems are in many cases exceedingly poor. Dr. Wells's edition also contains many beautiful lithographic plates, which add greatly to its value as a guide to growths and operations, and each chapter is increased in value by the very complete bibliography which follows it, which is absent in the publication of the J. B. Flint Company.

The book which we now notice contains six hundred and four pages, and is sold for six dollars a volume. Its cheapness will no doubt bring it within the means of many physicians, and it possesses many of the advantages, so far as general information is concerned, which the handsomer edition contains, save in the additions already spoken of. The cut showing a "figure-of-eight pessary," in place after the reduction of retrodeviation of the uterus, on page 285, is scarcely more than a smear. The book is, however, deficient in workmanship rather than in the material which it contains. The choice certainly lies in favor of Messrs. William Wood & Co.'s edition.

Correspondence.

LONDON.

(From our Special Correspondent.)

Paralysis of the diaphragm, fortunately a rare affection, is, in the opinion of some, a symptom which is frequently overlooked. Dr. Suckling has recently stated his belief that the cause of the great majority of sudden deaths after diphtheria is far more frequently paralysis of the diaphragm than syncope. He gives notes of three cases of diphtheria, all fatal, occurring in his practice during the past year, and in each of which the cause of death was diaphragmatic paralysis. The diagnosis was undoubted, for there was a clear history of diphtheria, and paralysis of the legs. Phonation was very feeble, and the hypochondrium became depressed, instead of propelled forward, on the affected side during inspiration. The non-descent of the diaphragm could also be felt by the fingers placed under the ribs. The treatment employed is embodied in that of diphtheritic paralysis generally. Rest in bed was enforced from the first, and plenty of nourishing food was given. Iron and strychnine were employed in large doses. When the diaphragm began to fall, the patients were propped up in bed, so as to render its descent more easy. A mild faradic current was applied at intervals, and blistering fluid painted along the course of the phrenic nerve. Against this very gloomy record Dr. G. H. Cooke records his own experience of the affection, which is far more favorable. He quoted also the opinion of the late Professor Ross, of Manchester, that only a small percentage of such cases

was fatal. Dr. Cooke's treatment of a case of diaphragmatic paralysis differs but little from that above noted, but he lays stress on the fact that strychnine, given hypodermically in small doses, seems to have considerably more effect than much larger quantities taken internally, and in this opinion he agrees with most English and Continental observers. The risk of abscess formation is very slight if the needle and syringe employed be clean. Cleanliness, in a chemical and bacteriological sense, used formerly to be most difficult to obtain when the only packing for syringes was a dirty, oil-containing, and seldom-renewed pair of leather washers. With the syringes now largely used in this country, made only of a combination of glass, metal, and asbestos, all of which will stand boiling before and after use, there need not be the slightest risk of the production of local inflammatory mischief by hypodermic injections.

The physiological action of the active principles of *Urechites suberecta* has been the subject of a careful study by Dr. Ralph Stockman, who was recently one of the Research Scholars of the British Medical Association. The plant grows abundantly in the West Indies, where it is known as the yellow-flowered nightshade. It contains two active principles, both glucosides,—viz., urechitin and urechitoxin,—and it is believed that an extract of this plant is well known and used as a poison by the Obeah, or "medicine-men," of Jamaica, etc. As regards the two active principles, their action appears to be almost the same, both causing death by arrest of the heart. Dogs seem particularly susceptible, a dose of 2 milligrammes of urechitin being fatal in one instance in thirty-eight minutes. The symptoms of acute poisoning consist in severe and continued vomiting, great muscular weakness, and marked slowing and irregularity of the heart. At the same time there is greatly increased intestinal peristalsis, the involuntary muscular fibres of the intestines and bladder being specially affected, as well as the heart. The amount of the dose does not greatly influence the rapidity of death, for one dog, which received two centigrammes, did not die for at least twelve hours. The above description applies very nearly to urechitoxin, but this latter substance is somewhat less poisonous, and slower in its action than the former. Rabbits require much larger doses than dogs before a fatal effect is produced. Both substances must be classed among the muscle and heart poisons, of which digitalis is the chief example. The more minute differences between these drugs and the other members of the same group have not yet been fully studied. A point of great interest is the fact that a cumulative action can be readily set up, as also by digitalis, by very small doses, repeated at intervals; and the plant has probably been used in this way by the "Obeah men," or professional poisoners of the West Indies and Central Africa. Mixed with food, and used in this way daily, it would probably be easy to cause a long-delayed and sudden death of a victim without arousing suspicion. As will be imagined, the drug is very slowly excreted, and Dr. Stockman does not think that it will ever come largely into use as a cardiac tonic, seeing that it is in no way superior to digitalis, while it possesses a much greater and more dangerous cumulative action.

Small-pox has been, unfortunately, somewhat prevalent during the last few weeks, and amounted to the proportions of an epidemic in some parts of the kingdom. This fact has been utilized in the most unblushing manner by the antivaccination hobbyists, who advance it as another proof of the uselessness of vaccination. The real facts, however, show how grossly these people attempt to deceive the ignorant public; for, from a return of the medical officer of health for Sheffield, the following facts are clearly evident: Out of every thousand unvaccinated children (under ten years old), one hundred and one were attacked; out of every thousand vaccinated children, five only were attacked. Liability to infection was, therefore, twenty times as great in unvaccinated as in vaccinated children.

In persons over ten years old, out of every thousand unvaccinated, ninety-four were attacked; of each thousand vaccinated, only nineteen were attacked. The same marked influence is shown on the death-rate. Among children, forty-four per cent. of the unvaccinated cases died, and only two per cent. of those vaccinated. In those over ten years, fifty-four per cent. of those unvaccinated died, and five per cent. of those vaccinated. On analysis, these numbers show that during the prevalence of an epidemic of small-pox, an unvaccinated child, under ten years of age, is four hundred and forty times more likely to die of the disease than a vaccinated child, and that above that age an unvaccinated person is fifty-five times more likely to die than a vaccinated one. If further proof were wanting of the absolute and complete protection afforded by *recent* successful vaccination, it would be afforded by a case which

I saw a short time ago in the London small-pox isolation ships. A mother contracted the disease, and was sent with her infant to the hospital. The child was promptly vaccinated, and, although suckled by its mother, showed no sign of small-pox during a whole month's stay in the wards. I notice, too, that the character of the cases now seen is totally different from that of those which served as models for the old classical description of the disease. Confluent cases are a rarity, and hemorrhagic cases hardly occur. With such evidence, the removal of the prejudice, even of the ignorant, against vaccination, and the equally important *revaccination*, cannot be long delayed.

Mercurial salivation is one of the troubles frequently met with among workmen employed in the manufacture of incandescent electric lamps. In the *Electrical Review*, Mr. Leigh Powell has lately described a plan of combating this evil. The method is really due to M. Triquet, a member of a firm of lamp-makers, who, himself falling a victim, cured himself by taking small doses of iodide of potassium dissolved in milk. Having been successful in his own case, he then applied the same treatment to workmen similarly affected, and with such success that they all recovered. That factory is now free from cases of salivation, and it is a routine practice among the workers to take frequently small doses of potassium iodide (about .25 gramme in 400 c.c. of milk).

Deaths under chloroform still continue to be unpleasantly frequent. Two fresh cases are reported in the medical journals for the present week, one occurring at Liverpool and the other at Evesham. The subject of anæsthesia seems to be of such importance that it has been decided to hold a discussion, during the coming annual meeting of the British Medical Association, on the bearing of recent physiological and chemical work on the question. While in no way wishing to throw discredit on the capabilities of the modern doctor, I cannot but think that some regulation, under which all students, before they received their degrees, were compelled to attend a systematic course of instruction in the production of anæsthesia, would be of great use, if not in preventing deaths, at least in giving them confidence when an anæsthetic had to be given subsequently. Very often, a young man in this country has to give chloroform without any special knowledge, the outcome of teaching by an experienced administrator. While a student, he is compelled by law to learn how to perform the simple operation of vaccination. Why should he not be forced to make himself familiar with the details of this other far more intricate and more dangerous operation? Whether the danger lies entirely in the drug itself, or in its impurities, in the idiosyncrasy of the patient, or in the inexperience or inattention of the administrator, is, however, too much to say. Probably these and other possible causes will be brought forward at the coming discussion, in which it is hoped that partisanship of any one school of thought will not allow judgment to be obscured on the whole question as there brought forward.

Severe bleeding after the operation of tonsillotomy is without doubt a most embarrassing complication, and one which may greatly tax the resources of the surgeon. In a case recorded recently by Mr. Arbuthnot Lane, it was found necessary to tie the common carotid before the hemorrhage could be arrested. Since the publication of this there have been various alternative treatments described as successful in similar cases. Thus, Mark Hovell advocates the rubbing in to the cut surface by means of the finger of a paste consisting of tannic and gallic acid (3 to 1); another recommends the application of liquor ferri perchloridi fortior. But the method which seems by far the most reasonable is that followed by Bilton Pollard, who sees no reason to depart in this instance from the ordinary rules of surgery, and, with the aid of Spencer Wells's forceps, ties the bleeding vessels at the point of injury. This can, he says, be nearly always accomplished without much difficulty. The same surgeon also draws attention to the fact that a good many soft and friable tonsils which require removal can, in suitable patients, be removed much more readily by enucleation with the finger-nail than with the ordinary guillotine.

CREDIT FOR PRIORITY IN THE CONTINUOUS INHALATION OF OXYGEN IN SEVERE CASES OF PNEUMONIA DUE TO DR. A. N. BLODGETT, OF BOSTON.

To the Editors of the THERAPEUTIC GAZETTE:

DEAR SIRS:—In your valuable number of the THERAPEUTIC GAZETTE for last June an editorial is devoted to the "Therapeutic Uses of Oxygen," in which prominent reference is made to a note of Dr. Brunton's published in the *British Medical Journal* detailing the good effects which he had obtained by the adminis-

tration of oxygen to a patient at death's door; and saying that, as a result of this, the medical journals have hastened to abstract the note and to endorse the recommendation of so eminent an authority.

The article referred to is in the *British Medical Journal* of January 23, 1892, and is "On the Use of Oxygen and Strychnine in Pneumonia," by Drs. T. Lauder Brunton and M. Prickett, so that if any great amount of credit is due here (which the authors do not claim), it ought to be shared equally between Drs. Brunton and Prickett. To a careful reader of this article the inference is quickly drawn that if the administration of oxygen had been *continuous* the patient would, in all probability, have recovered, for the authors say, "We regretted that we were not summoned when the symptoms became worse, as we might possibly have done good artificial respiration with oxygen." They make no reference to the use of oxygen in similar cases by any one else.

If you wish to give credit for priority in the CONTINUOUS administration of oxygen to a patient at death's door with pneumonia, it belongs to Dr. A. N. Blodgett, whose paper on this subject was published in the *Boston Medical and Surgical Journal* of November 20, 1890, and an abstract of which promptly appeared in the supplement to the *British Medical Journal* of December 20, 1890, more than two years before the note of Drs. Brunton and Prickett on the same subject.* Doubtless neither Drs. Brunton nor Blodgett ever thought of setting up any claim for priority in the use of oxygen in hopeless cases of pneumonia; but seeing that others have done this for them, it seems just and proper that this should be made clear. And with this object allow me to present in full the abstract of Blodgett's paper in the *British Medical Journal* of December 20, 1890, as Brunton's was afterwards published in the same journal.

"A remarkable case of pneumonia successfully treated by continuous inhalation of oxygen is reported by Dr. A. N. Blodgett (*Boston Medical and Surgical Journal*, No. 21, 1890). The patient was a lady, aged 37, of neurotic tendencies, who suffered at first from ordinary lobar pneumonia at the base of the right lung. The general symptoms were very strongly marked, and after the first few days of ordinary treatment the disease spread to the upper part of the same lung, and alarming and excessive dyspnœa set in rather rapidly. Energetic stimulation and counter-irritation appeared to relieve the condition to some extent, but it recurred, and showed itself less amenable to treatment. Inhalations of oxygen were given, the gas being simply conducted to the patient's mouth after having been passed through a wash-bottle, and diluted with ten per cent. of nitrous oxide. Very decided relief was given for a short time, but again and again the dyspnœa returned, each time being staved off by the inhalation. At last it became necessary to keep up constant inhalation. The supply of gas began to fail, and before a fresh store could be obtained the patient was moribund. The gas was then given by means of artificial respiration, and the patient rallied once more. Constant inhalation was then kept up for one hundred and six hours without intermission, and at the end of that time the breathing was easy and natural, and complete recovery followed without further incident. The temperature fell during the long-continued inhalation, the average amount of gas being two hundred gallons in each twenty-four hours. Dr. Blodgett states that the effect of the gas was 'almost as pronounced and evident as is that of a ligature in hemorrhage.'"

Dr. Brunton lost his patient from want of the *continuous* use of oxygen. Dr. Blodgett saved his by its *continuous* use and by *artificial respiration.*

In an extended research through modern literature, prior to the publication of Dr. Blodgett's paper, I can find nothing on the subject of the *continuous* use of oxygen in patients almost dead with pneumonia. I was present at the medical society when Dr. Blodgett read his paper. The foregoing statements are made by no request of his, but are entirely voluntary on my part.

Very truly yours,

DOUGLAS GRAHAM, M.D.

BOSTON, MASS., July 9, 1892.

A PRESCRIPTION FOR BURNS.

℞ Europhen, gr. xlv;
Olive oil, ʒii;
Vaseline, ℥ii;
Lanolin, ℥i. M.
Sig.—Apply externally.

—*La France Médicale*, April 22, 1892.

* The *British Medical Journal* of February 6, 1892, also quoted from Dr. Blodgett's paper, and it was from this paper that the *American Journal of the Medical Sciences* of May, 1892, page 578, first took notice of the subject.